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ABSTRACT

This collection of 120 project resumes is a survey of programs, projects, and activities in progress at the National Coordination Center and at each of the seven centers associated with the National Laboratory on Early Childhood Education. Each resume is coded according to laboratory category and name of center involved. The title of each specific project and the name of the projects' principal investigator is given. Each resume includes a capsule statement of goals, rationale, method, characteristics of users, expected results, and evaluation procedures. (WY)

NATIONAL LABORATORY ON EARLY CHILDHOOD EDUCATION

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PROGRAM—PROJECT RESUMÉS

1969-1970

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NATIONAL COORDINATION CENTER

70706-N

Lab. Cate.	Center Code	Program, Project/Activity Title	Principal Investigator
2.	N-A	Research Operations Program	James O. Miller
4.	N-D	Resource Production Program	James O. Miller
1.	N-E	Operations and Central Services Program	Joseph Smoltz
1.	-EE	Fiscal Coordination--Review, Reporting, and Accountability	Joseph Smoltz
1.	-EF	Physical and Logistics Management	Joseph Smoltz
1.	-EG	Central Services	Joseph Smoltz
1.	-EH	Personnel and Administrative Services	Joseph Smoltz
1.	N-G	Program Planning and Evaluation	Myrtle Scott
1.	-GA	Needs Analysis and Conceptualization	Myrtle Scott
1.	-GB	Planning	Myrtle Scott
1.	-GC	Evaluation	Myrtle Scott
1.	-GD	Synthesis and Integration	Myrtle Scott
3.	N-H	Development and Demonstration	Myrtle Scott
3.	-HA	Development of Models of Early Childhood Education	Myrtle Scott
3.	-HB	Demonstration of Early Childhood Models	Myrtle Scott

Title: Research Operations Program

Principal Staff: James O. Miller

Purpose, objective, or goals:

1. To stimulate, facilitate, and support a focused programmatic research effort in the field of early childhood education and development.
2. To develop and implement procedures and mechanisms for maintaining and further establishing effective collaborative arrangements within the National Laboratory and between the National Laboratory and other instrumentalities.

Importance, need, or justification:

The activities and projects in this program are designed to stimulate research efforts in the various component centers in keeping with the National Laboratory's mission, goals, and objectives. Focus of the research program will be on the development of a sound knowledge base including studies of developmental processes, individual characteristics and environmental influences. In the area of applied experimentation studies of instructional content, methods and techniques, delivery systems and larger intervention studies will provide the second step in the movement of knowledge to application. In support of these two major areas of research, support will be given to the development of research technology including instructional materials design and testing and the design and validation of assessment instruments.

The organizational pattern of the National Laboratory supports opportunities for collaborative research between institutions built on a variety of populations geographically distributed throughout the United States. Collaborative work in itself should help strengthen the ongoing research of the centers while an active program to highlight the collaborative possibilities should stimulate work on problems not presently being researched in any of the centers but which are in keeping with the goals and mission of the total Laboratory.

Method, strategy, or design:

The substantive input from the planning and evaluation program will form the basic long-range plans, priorities, and direction for the research program moving it toward a more programmatic effort. As the development of early childhood education models progresses, focus of the research to support this facet of the Laboratory's endeavor will become increasingly important particularly in the applied experimental project. Thus a system of mutual feedback will be generated throughout the Laboratory.

Both internal as well as external means of evaluation of the product and process of the research program will be developed in cooperation with the evaluation team. The research steering committee will have a major voice in the development of policy relevant to the research endeavor. They will assist in providing substantive input to the planning and evaluation program through synthesis of research and summaries of program literature.

The central staff will compile analyses of the present work in the research centers which will be used for planning purposes, dissemination to the research community and direct application in the developmental program.

In regard to internal collaboration, the strategies include:

1. Use of program analyses to identify common research problems around which additional collaborative efforts might be encouraged and supported.
2. Conferences of investigators within the Laboratory complex to design collaborative research efforts on selected topics.
3. Steering committee deliberation regarding pressing problems which need collaborative efforts and where collaborative arrangements can be made.

In terms of external collaboration:

1. Continuous maintenance and updating of the

catalogued investigators presently engaged in early childhood education research will provide a resource for promoting selective conferences and a basic dissemination communication network for research.

2. Continued encouragement of collaboration with those instrumentalities outside of the Laboratory which have a major investment in early childhood education.

Characteristics of the users:

The program has as its target population the research components of the National Laboratory and other instrumentalities with a heavy investment in early childhood research.

Expected end products of results:

1. Report on laboratory program analysis.
2. A priority list for fund allocation based on objective criteria.
3. Register of program products and a descriptive brochure on the research program of the National Laboratory.
4. Comprehensive long range plans for the research effort.
5. Comprehensive plan for program review and evaluation.
6. Updated catalog of active early childhood researchers.
7. Specific collaborative arrangements within the Laboratory and with outside agencies to further the goals and objectives of the National Laboratory.

Evaluation procedures:

In this program year, a comprehensive evaluation system will be developed for the research program in cooperation with the members of the program planning and evaluation staff. Emphasis will be placed upon external evaluation of programs within the Laboratory by independent advisory groups and shall form substantive input for further planning.

Relationship to other projects and center focus:

The research program is one of the major efforts of the Laboratory and is the core of the substantive work of the component centers. It contributes directly to the development and demonstration programs of the Laboratory.

N-D

Title: Resource Production Program

Principal Staff: James O. Miller, NCC Staff

Purpose, objective, or goals:

1. To develop and maintain a media production capability including the necessary staff and equipment for initial development of soft wear and disseminable products.
2. Development and maintenance of a communications network which serves internal needs as well as dissemination needs of the Laboratory to the field.
3. Maintenance of centralized storage and retrieval systems including data banks, register of investigators, catalogs of publishers and materials vendors, and information resources supporting the research and development programs.

Importance, need, or justification: A basic support capacity for the total laboratory program which includes those specific areas outlined in the objectives is a basic need of the Laboratory. Centralization of these resources will provide a quality resource production program at a minimum cost with maximum utilization potential. Since the development efforts of the Laboratory will be primarily centralized, the heaviest call for production staff will be at the site of the central facility.

Method, strategy, or design: Phasing of the development of this program will be consistent with the high priority needs within the substantive program areas. Of particular concern is development of a staff with graphics and writing expertise to assist the development program. This same group of production people would have a major commitment for design, layout and production of laboratory products including the periodic newsletter. Heavy investment for communications would be placed in the newsletter, occasional papers, and research summaries which have been on the increase over the past year.

Characteristics of the users: Users will be primarily those within the Laboratory network specifically the research and development programs and appropriate external audiences.

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Evaluation procedures:

Evaluation is based primarily on productivity and efficiency in serving the substantive programs of the Laboratory.

Expected end products of results:

1. Appropriate services to the substantive areas in the design layout and production of Laboratory soft wear. This would include curriculum manuals, instructional program materials, major reports, state-of-the-art papers, research reports, etc., films and visuals for dissemination.
2. Periodic newsletter and such occasional papers as are called for.
3. Maintenance of data banks, register of investigators, and other information resources.

Program time schedule:

The development of a solid resource production program for the Laboratory is a continuous process. Major emphasis will be placed upon the media production capabilities starting with acquisition of staff for layout, writing, and graphics. It is expected that it would take approximately three months to develop a core staff for this activity. In six months tne basic capabilities should be functioning at the expected production schedule level.

Resources:

Resources are expected to be developed over this contract period.

Title: Operations and Central Services Program

Principal Staff: J. Smoltz

Purpose, objective, or goals: To develop an integrated cooperative effort which provides for fiscal monitoring, physical and logistics management, staffing and personnel operations, and central services.

Importance, need, or justification: The activities in this program are necessary installations in the overall laboratory plan and will provide for sound, systematic management of the day to day operations. Advantages will accrue to the laboratory through the component units as they provide the input to this program.

This program needs a high priority placement in view of the necessary functions. These include:

1. Fiscal monitoring, recording, and review.
2. Cost progress evaluation.
3. Purchasing equipment and supplies.
4. Inventory control.
5. Facilities management, acquisition, and construction.
6. Staff acquisition and records keeping.

Method, strategy, or design: The strategies involved will be the continuation and improvement of fiscal monitoring and reporting procedures initiated during fiscal 1969.

Those activities associated with the operation of a business structure will be initiated. These will include inventory control, purchasing, records, personnel files, facility acquisition, construction and maintenance.

A reproduction service unit will be developed within the Operations Office to reproduce the products of the laboratory and to disseminate those products through the maintenance of a mail distribution center.

Expected end products of results:

1. Uniform reporting, recording and reallocation procedures.
2. Appraisal and analysis procedures.
3. Records keeping systems.
4. Inventories.
5. Equipment and supplies.
6. Facilities, communications systems.
7. Fiscal control room.

Evaluation procedures:

Evaluation will be primarily the measurement of the degree of usefulness resulting from the flow of information and services within the program to the users. Procedures will be developed to evaluate the methods of obtaining information and providing services. Essential to efficiency will be attention to parsimonious reporting and recording systems.

Flow chart, time schedule:

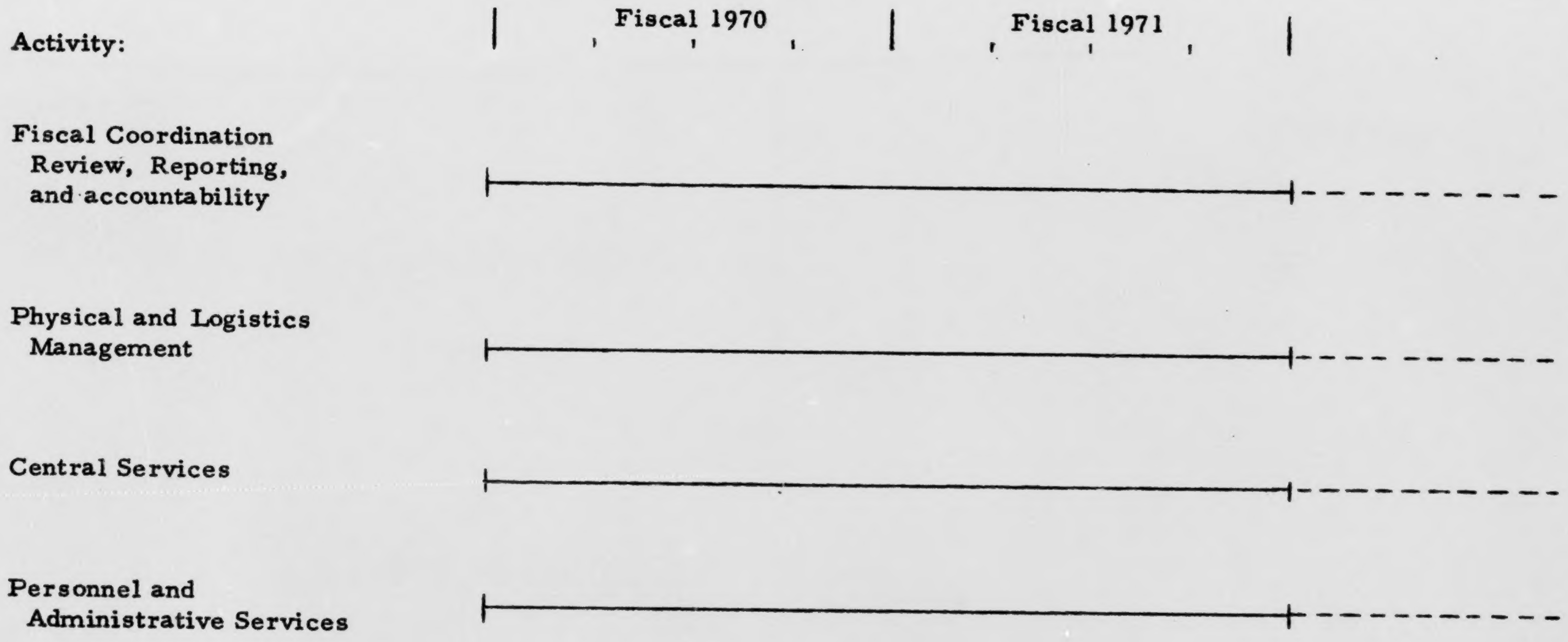
The time schedule will call for those activities begun in fiscal 1969 to continue. Activities in this program will be operable as conditions require implementation.

Resources:

1. Component Centers, NCC Staff.
2. Administrative-management skills.
3. Specified pieces of hardward such as office equipment, printing equipment, data processing, etc.

Program Time Schedule

Program: Operations and Central Services



N-EE

Title: Fiscal Coordination - Review, Reporting, and Accountability

Principal Staff: J. Smoltz

Purpose, objective, or goals: Three primary objectives are supported in this activity with each containing secondary objectives.

1. A review system which will show project cost to date, estimated completion time, funds needed to complete, and a comprehensive but parsimonious, report plan.
2. To maintain and update the present reporting system to provide for continued fiscal monitoring, cost evaluation, inventory control, etc.
3. A routine and traditional cost accounting system which will provide the information necessary for reimbursement to subcontractors.

Secondary objectives:

1. a. To compare expected and actual costs.
    - b. To predict future costs.
    - c. To isolate trouble areas and predict overruns or underruns for reallocation.
    - d. To provide project control room for displaying and interpreting information.
2. a. To provide a regular reporting cycle.
    - b. Evaluation of proposed or actual changes in resources levels.
    - c. To develop other input requirements tailored to specific needs.
    - d. To design a system which will produce the maximum amount of information with a minimum amount of labor.
3. a. To provide a basic and uniform reporting procedure for laboratory fiscal officers.
    - b. To maintain a complete records system of reports submitted.
    - c. To develop a standard time schedule for reporting and reimbursement.
    - d. To develop timely financial reports and information on the business affairs of the laboratory.

Importance, need, or justification: Central to sound management and policy decisions is information which is sensitive to cost, time, performance. Activities in this project will provide the information needed to assist management in the decisions relating to the efficiency of a program. These include fiscal monitoring, reporting, review; cost, time, performance analyses.

Method, strategy, or design: The strategy for this activity will be based upon those areas already designed and implemented. They include a fiscal monitoring and reporting system and a reimbursement request procedure for subcontractors. Maintaining and updating the present design will continue.

Characteristics of the users: Responsible fiscal agents within the laboratory.

Expected end products of results: The major product will be timely, accurate, meaningful, and integrated information to aid in decision making and action.

Evaluation procedures: Evaluation will be made through the continued assessment of the importance and usefulness of the output of information in the three areas encompassed by this activity. Another check will be the amount of aid provided in the decision making and action taken areas.

Resources: Planning and management consultants, center directors, center fiscal officers, NCC staff.

N-EF

Title:	Physical and Logistics Management
Principal Staff:	J. Smoltz, NCC Operations Staff
Purpose, objective, or goals:	1. To develop and install procedures for purchasing supplies and equipment and the inventory of same. 2. To install and maintain a communications system which includes telephone communications with central directory service and a mail distribution center. 3. To provide and plan for facility acquisition, maintenance, and expansion. 4. To plan and develop short and long range physical needs of the laboratory.
Importance, need, or justification:	Physical and logistics management is an important area to serve the purpose of administration, administrative integrity, public accountability, and the many support type functions maintained for the smooth operation of any organization. The staff within this activity will have the responsibility for providing the laboratory staff with the supplies, equipment, communications, etc. needed to support the substantive activities.
Method, strategy, or design:	The strategies will include the development of logistical planning and management procedures. Important in this activity will be the development of efficient and useful forms so that the physical needs of the laboratory can be fulfilled expeditiously.
Characteristics of the users:	The users will be the laboratory staff.
Expected end products of results:	Products will be the constant maintenance and updating of inventories, purchasing procedures, communications and mailing services, physical requirements.
Evaluation procedures:	An obvious evaluation will be the level of achievement and efficiency in fulfilling the objectives of this activity. Time and performance criteria will also serve as a check.

N-EG

Title: Central Services

Principal Staff: J. Smoltz, NCC Staff

Purpose, objective, or goals: To provide program support for the laboratory through the maintenance of a reproduction service unit. This unit would provide the equipment, staff, and other resources to reproduce some of the products. A catalog of vendors will be compiled and maintained which will provide production sources for those items which could not be reproduced by the laboratory or would not be practical. These items include films, video tapes, specific kinds of art work and design, etc.

Importance, need, or justification: Each component of the laboratory is moving to phases which will demand the type of services provided by this activity. The Coordinating Center must be prepared to adapt to these increasing needs and to produce the materials of the laboratory.

Method, strategy, or design: Adequate staff must be assembled before this project can function. A technical staff with knowledge and experience to operate production equipment will make up the additional personnel.

This activity will also have responsibilities for mail supervision, including mail distribution and maintenance of mailing lists for the various publications and other products.

Characteristics of the users: Appropriate audience consistent with the products produced by the laboratory.

Expected end products of results: The products will be a variety of jobs requested by the laboratory. These will include reproduction of or contracting the printing of books, papers, films, tapes, slides, etc.

Evaluation procedures: Evaluation will be an on-going assessment of the process, efficiency of production, smoothness, responsiveness to demand and call, and cost effectiveness. Outside evaluation of the substantive material will be made by the appropriate audience.

Existing resources: Resources include: Offset press, small mimeograph, small duplicator, collating machine, paper jogger, and scanning device.

N-EH

Title: Personnel and Administrative Services

Principal Staff: J. Smoltz, Operations Staff

Purpose, objective, or goals:

1. To develop procedures for hiring technical and support personnel.
2. To employ technical and support staff.
3. To develop personnel records systems, filing procedures, and related services.
4. To maintain an office of personnel and administrative services.
5. To assess staffing needs.

Importance, need, or justification: Technical and support staff are essential to the smoothness and efficient operation of all phases of the laboratory. The recruitment and retention of quality personnel plays an important part in the overall laboratory plan.

Method, strategy, or design: In order to insure the recruitment and retention of quality personnel, certain benefits must be developed such as: an appropriate, competitive salary schedule; an attractive employee benefits program including insurance, retirement, etc. A permanent filing system will be designed to maintain adequate records. All pertinent personnel record forms will be developed such as employee benefits forms, application forms for various positions, and other related forms. An office manual will be developed to insure a standardized operating procedure.

Characteristics of the users: Users will be laboratory personnel.

Expected end products of results: Products will include office and staff manual, records systems, hiring procedures, personnel forms.

Evaluation procedures: The quality and quantity of work produced, staff retention, job performance criteria.

Resources: Laboratory staff.

Title: Program Planning and Evaluation

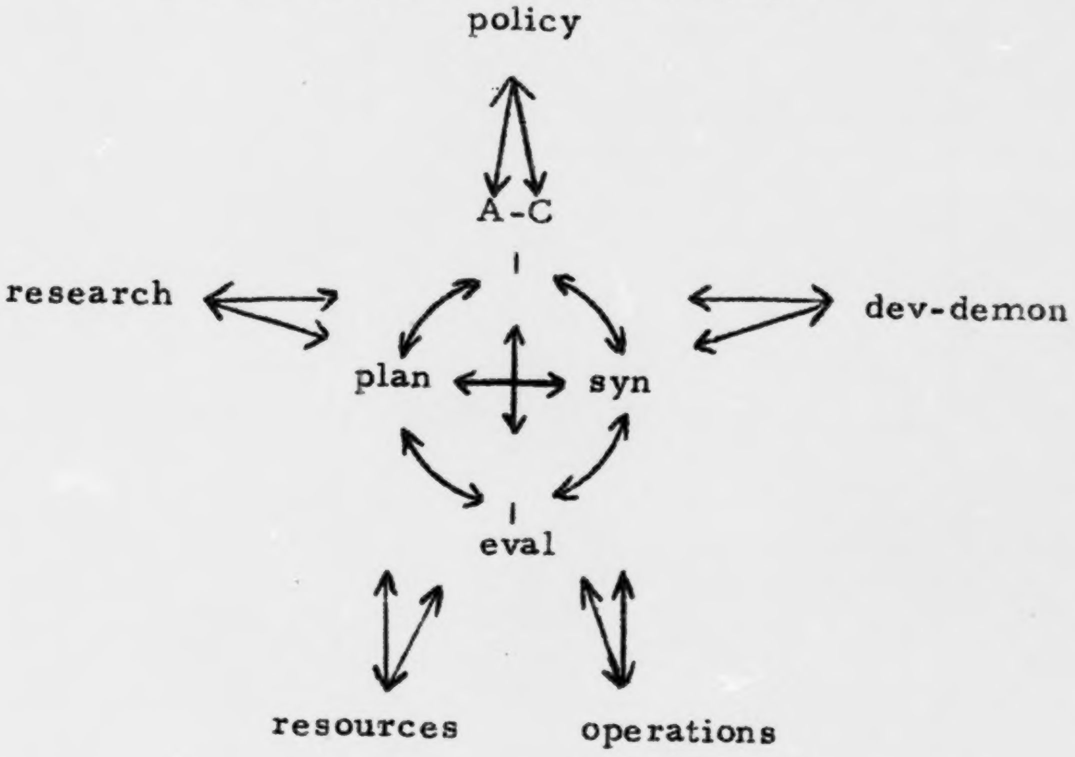
Principal Staff: Myrtle Scott

Purpose, objective, or goals: To design, develop and implement procedures and mechanisms which will provide for coherent, well organized, well integrated iterative plans for work to be carried on in the National Laboratory and to design, develop and implement procedures and mechanisms which will provide for the sound evaluation of this work.

Importance, need, or justification: The basic assumption upon which programmatic research rests is that of planning which is both comprehensive and iterative. Sound evaluation procedures are a necessary part of such planning in order to adequately demonstrate the works of the Laboratory and in order to make future work maximumly congnizant of work now in progress or completed. Thus, this program is fundamental to the core of the National Laboratory effort.

Method, strategy, or design: This program is seen as having four major activities which are both discreet and interrelated both to each other and to other programs and activities within the National Laboratory. A first step in planning and evaluation is an analysis and conceptualization of the needs and problems of the field. During the coming year, this needs analysis and conceptualization will be targeted toward certain specific areas of critical concern and high priority to the work currently in progress in the Laboratory. Planning will then take place following a substantive consideration of these needs with specific input from (1) synthesizers and integraters, (2) investigators directly involved in the work, (3) systems planning personnel, (4) evaluation personnel, and (5) policy determiners. When such plans have been implemented according to the foregoing procedures, they will then be evaluated in an unambiguous and objective oriented framework. Such evaluations along with analyses of needs will then be reviewed, summarized, synthesized, integrated, and interpreted with specific projections made for further needs, problems, etc. Each of the

Method, strategy, or design: (continued) activities of effective program planning and evaluation are intimately interrelated to each other as well as to other programs within the laboratory and might be represented diagramatically as follows:



Characteristics of the users: The program has as its specific target population all of the components in the National Laboratory complex and as its projected general population the field of early childhood education.

Decision making procedures and evaluation design: Evaluation will be the joint task of the evaluation component working with specific components as indicated with the evaluation personnel having final responsibility for implementing the actual evaluation. Procedures and mechanisms will be designed, developed and implemented for evaluation on the basis of a criterion reference for each component program, etc. Program priorities will be established and decisions will be made jointly by the program planning and evaluation staff following a thorough review of all appropriate information. The program director will have final responsibility for the implementation of such decisions in light of the general goals, objectives and priorities set by the Laboratory.

Expected end products or results:

End products or results of program planning and evaluation will include among others:

1. position and state-of-the-art papers concerning
   (a) basic child statistics and population analyses
   (b) impact of present and pending legislation upon programs and support
   (c) statistical information on current programs
   (d) information concerning training programs
   ( ) processes underlying the development of competence in 4 and 5 year old children.
   (f) areas of competence which must be developed in the natural setting of the four- and five-year-old urban deprived child
   (g) a content oriented paper concerning instructional programs for 4 and 5 year old children
   (h) assessment of 4 and 5 year old children
   (i) ecological factors influencing the development of competence in 4 and 5 year old children
   (j) of second order priority are papers on topics E-I relative to 3 year old children who are potential candidates for day care.
   (k) a next priority focus will be directed toward a paper on the processes underlying the development of competence in infants.

These papers will include an analysis of present needs of the field in these areas, alternate strategies for meeting these needs and specific recommendations for policy of the Laboratory as well as other concerned agencies.

2. policy development documents
3. a comprehensive plan for implementing the research of the Laboratory as a whole
4. a comprehensive plan for early childhood education model development
5. a comprehensive plan for the implementation of a demonstration program
6. procedures and mechanisms for evaluation of
   (a) research of the Laboratory as a whole
   (b) model development
   (c) demonstration
   (d) performance of programs within the Laboratory

7. evaluation documents concerning
    (a) research of the Laboratory as a whole
    (b) model development
    (c) demonstration
    (d) program performance of programs within the Laboratory

Program time schedule: The process of planning and evaluation is seen as continuous and iterative as represented in the previous diagram.

Resources: Resources needed are primarily staff with appropriate cababilities to implement the proposed activities.

N-GA

Title:	Needs Analysis and Conceptualization
Principal Staff:	Myrtle Scott, Information Analysts, Visiting Scholars
Purpose, objective, or goals:	Several areas have been identified as being of critical importance to the work currently in progress throughout the National Laboratory. The objective of this activity is to design, develop and implement procedures and mechanisms for obtaining in-depth information concerning these critical areas and for analyzing and conceptualizing the needs of the field relative to these areas.
Importance, need, or justification:	The first step in programmatic research effort is an analysis of the needs of the field and a conceptualization of these needs toward planning. Adequate information must be obtained and organized in order for such analyses and conceptualizations to take place. This activity attempts to address itself to this need.
Method, strategy, or design:	The strategies of this activity will include: 1. Collection of the information according to the systems devised. 2. Analysis of the information. 3. Presentation of the analyses in appropriate forms. 4. Continued collection of data on the Register of Investigators in Early Childhood Education. 5. Continued analyses of early childhood education programs external to the National Laboratory. These strategies will be implemented by the regular laboratory staff, visiting scholars and fellows who will form a continuing community to give direction to this activity and to carry out its work.
Characteristics of the users:	Users are, specifically, the program planning and evaluation staff as well as all of the components of the National Laboratory complex and, more generally, the field of early childhood education.
Decision making procedures and evaluation design:	Initially evaluation will be done in terms of the number and usefulness of analyses produced. In addition, the evaluation staff will be given the task of exploring

what further evaluative procedures might be appropriate for use with this activity. Program decisions will be made jointly by the needs analysis staff in conjunction with staff of other activities within this program as well as other programs throughout the laboratory as appropriate following a thorough review of all appropriate information. The program director will have final responsibility for implementation of such decisions in light of the general goals, objectives, priorities, and policies of the National Laboratory.

Expected end products of results:

End products of this activity will be:

1. Collections of information concerning the needs of the field.
2. Analysis of these needs.
3. Retrieval systems concerning this information.
4. Transfer procedures concerning such collections when appropriate.
5. Position papers in the following specific areas:
   a. basic child statistics and population analyses,
   b. impact of present and pending legislation upon programs and support,
   c. statistical information on current programs,
   d. information concerning training programs.
6. Updated Register of Investigators in Early Childhood Education.
7. Further analyses of early childhood education programs external to the National Laboratory.

Program time schedule:

Needs analysis and conceptualization is a continuous and iterative activity, with specific work task load varying with the work of the laboratory in conjunction with its goals, objectives and priorities.

Resources:

Resources include two information analysts, with appropriate operational support modules for each.

N-GB

Title: Planning

Principal Staff: Myrtle Scott, Systems Analysts, etc.

Purpose, objective, or goals: To develop well-organized, well integrated coherent plans for the work to be carried on in the National Laboratory toward the achievement of its specific goals and objectives both intermediate and long range.

Importance, need, or justification: The basic assumption on which programmatic research rests is that of sound planning. In order to develop a sound plan, specific resources, human material and time must be specially allocated for this task. This activity is designed to meet this need.

Method, strategy, or design: In order to develop a coherent well organized plan for the work to be carried on in the National Laboratory, the following procedures will be implemented:

1. Assessment and substantive consideration of the needs of the field with specific input from:
   a. needs analysis and conceptualization activities,
   b. investigators directly involved in the work,
   c. systems planners
   d. evaluation personnel,
   e. policy determination.
2. Development of coherent well organized, well integrated plans with specific objectives as well as sub-objectives which are measurable and attainable in the following specific areas:
   a. research of the laboratory as a whole,
   b. early childhood education model development,
   c. implementation of a demonstration program.
3. Assignment of priorities of various aspects of these plans in keeping with the priorities determined for the work of the laboratory as a whole.
4. Continuous review of the plans to determine when replanning is indicated or a plan needs to be cycled back through the planning procedure.
5. PPBS, Convergence techniques, PERI and other appropriate planning methods will be employed.

Characteristics of the users: This activity has as its target population all the components in the National Laboratory complex.

Decision making procedures and evaluation design: Evaluation design will be tied specificially to a plan and its goals and objectives and will have specific input from the evaluation staff. The plans themselves will be evaluated by criteria of internal consistency, attainability, feasibility, etc. Evaluative markers of the planning process will be ease with which the plans can be implemented, smoothness and flow as well as efficiency and cost effectiveness. Program decisions will be made jointly by the planning and evaluation staff in cooperation with other programs, components, etc. of the National Laboratory following a review of all appropriate information. The program director will have final responsibility for implementation of such decisions in light of the general goals, objectives, priorities and policies of the National Laboratory.

Expected end products of results: End products of this activity will be:

1. Comprehensive plans for the work of the National Laboratory in the following specific areas:
   a. research of the laboratory as a whole,
   b. early childhood education model development,
   c. implementation of a demonstration program.
2. Procedures and mechanisms for continuous review and replanning.

Project plan schedule: Planning is a continuous and iterative process.

Resources: Initial resources required are seen as one planning person with an appropriate operational support module.

N-GC

Title: Evaluation

Principal Staff: Myrtle Scott, Evaluation Specialists

Purpose, objective, or goals: To evaluate the work of the National Laboratory so that (1) its value will be appropriately and adequately demonstrated and (2) so that the results of this work will be fed back into work in progress and/or planned within the National Laboratory and the field generally.

Importance, need, or justification: In order to provide the knowledge base undergirding sound educational practices and in order to conduct research and development work which will provide this knowledge base in the most efficacious manner, it is necessary to be able to make valid and reliable statements concerning processes at work in children toward criterion behaviors, processes at work in instructional settings and systems toward the development of these child processes and, thirdly, processes and products at work in programs which seek to study the former two. A sound evaluation program is necessary to enable the making of these valid and reliable statements.

Method, strategy, or design: The strategies involved include:

1. providing specific input to planning
2. designing and developing procedures and mechanisms of evaluation for the following areas:
   (a) research of the Laboratory as a whole
   (b) ECE model development
   (c) implementation of a demonstration program
   (d) program performance of Laboratory progress, specifically, needs analysis, planning, evaluation and synthesis.

Decision making procedures and evaluation design: Specific evaluation procedures will be designed based on the specific criteria set by the program, component, etc. for which the evaluation is being done. For example, the goodness of the evaluation unit's input into planning will be evaluated by the ease with which the evaluation unit is able to evaluate this plan when it comes to them for evaluation at some later time. Another evaluative marker will be the evaluation component's ability to demonstrate the work of the laboratory appropriately

Decision making procedures and evaluation design (continued)	and adequately. Further assessment of the evaluation component will be done in terms of its heuristic value to further research and planning. Program decisions will be made jointly by the planning and evaluation staff in conjunction with other programs, components, etc. of the National Laboratory. The program director will be finally responsible for implementation of such decisions in light of the general goals, objectives, and policies set by the laboratory.
Expected end products of results:	End products will be evaluation documents concerning the following specific areas: (a) research of the laboratory as a whole, (b) early childhood education model development, (c) implementation of demonstration program, (d) program performance on Laboratory progress, specifically, needs analysis, planning, evaluation and synthesis.
Program time schedule:	This activity is continuous and interative.
Resources:	Immediate resources needed are at least one evaluation person with an appropriate operational support module. Other human resources might be contracted for on a consulting basis as needs develop.

N-GD

Title: Synthesis and Integration

Principal Staff: Myrtle Scott, visiting scholars, Laboratory staff

Purpose, objective, or goals: To give direction to research and development work by providing synthesis and integration of existing knowledge, practice or status of the field.

Importance, need, or justification: Targeted reviews of research associate with the processes underlying the development of competence are badly needed for research direction. Such reviews and syntheses are also needed concerning the current status of practice in the field of early childhood education. These products would provide valuable input into other components of the laboratory such as the development of models for early childhood education, training of early childhood education personnel, and others. In addition, they would provide substantive input into the evaluation program and the development of instruments.

Method, strategy, or design: The synthesis and integration function of the laboratory will be brought about by at least three strategies:

1. the regular members of the professional staff of the laboratory will attack the problems as indicated by the needs which have been identified,
2. a visiting scholar program will be initiated to provide breadth and depth of scholarship in specific areas as indicated,
3. a program of fellowships for younger and promising investigators will be instituted for supporting both capabilities. The regular professional staff, visiting scholars and fellows will form a continuing community and focal point for research and professional leadership in the field. Periodic substantive seminars will provide access for professionals in the field.

Papers which will be commissioned during the coming year and their respective priorities include:

1. processes underlying the development of competence in 4 and 5 year old children
2. areas of competence which must be developed in an educational setting which are not developed in the natural setting of the urban deprived four and five-year-old child,
3. a content oriented paper concerning instructional programs for 4 and 5 year old children

Method, strategy, or design (continued)

4. assessment, evaluation, and measurement of four- and five-year-old children
5. ecological factors influencing the development of competence in four- and five-year old children.
6. of second order priority are papers on topics 1-5 relative to three year old children who are potential candidates for day care.
7. a next priority focus will be directed toward a paper on the processes underlying the development of competence in infants

Characteristics of the users:

Users will be all components within the complex of the National Laboratory as well as the field of early childhood education generally.

Decision making procedures and evaluation design:

Initially evaluation will be done in terms of the number and quality of papers produced. Assessment of quality will be done by evaluation from the field. Program decisions will be made jointly by the program planning and evaluation staff in conjunction with other components, programs, etc. of the Laboratory as appropriate. Final responsibility for implementation of such decisions will rest with the program director in line with general goals, objectives and priorities and policies set by the Laboratory.

Expected end products of results:

End products of this activity will be:

1. state-of-the art papers in the following specific areas:
    - (a) processes underlying the development of competence
    - (b) areas of competence which must be developed in an educational setting which are not developed in the natural setting of the urban deprived four- and five-year-old child
    - (c) a content oriented paper concerning instructional programs
    - (d) assessment, evaluation, and measurement
    - (e) ecological factors influencing the development of competence
    - (f) papers on second and third order priority areas if resources allocation permits
2. seminars on selected target areas
3. policy development documents and others

Program time schedule:	Generally, this activity is continuous and iterative. For a schedule of specific priority papers.
Resources:	Regular staff will be utilized for the ongoing synthesis and integration. In addition, a canvas of the staff of the National Laboratory complex will be made immediately to determine what persons are already on board with capabilities related to specific priority papers. Following this an analysis of distinguished scholars in the field might be appropriate for specific additional works.

N-H

Title: Development and Demonstration

Principal Staff: Myrtle Scott, Coordination Center Staff

Purpose, objective, or goals:

This program encompasses two major and central activities of the National Laboratory:

1. The development of models of early childhood education.
2. The demonstration of their efficacy.

The specific objectives for the coming program year are:

1. To develop a prototypic model for the early education of the urban deprived four and five-year-old child.
2. To initiate validation of this prototype in a controlled testing situation.
3. To plan demonstration of this model.

Importance, need, or justification:

The great mass of work which has been produced in early childhood education during the last five years needs to be analyzed, synthesized and organized around coherent and logically consistent frameworks which will give direction to current practice. The development of a targeted model based on such synthesis and organization will provide guidance to those who must provide early childhood education programs.

Method, strategy, or design:

The models will be based on specifications currently under development within the laboratory. The specifications include:

1. Instructional systems,
2. Delivery systems.
3. Evaluation and installation data.
4. Support systems.

The existing data base produced from the work of the National Laboratory and others will then be integrated to model specifications. Once a prototype has been constructed it will be validated in a controlled testing situation. It will be translated from its abstract form into concrete observable behaviors through demonstration. A plan will be developed for the testing and demonstration which will:

1. Provide for the appropriate conduct of an educational program specified by the prototypic model.
2. Employ staff who are capable not only of demonstrating the model but of articulating the model with local situations.
3. Provide for the continued evaluation of the model.

Characteristics of the users:

Users will be practitioners in the field of early childhood education.

Decision making procedures and evaluation design:

Evaluation will be the joint task of the evaluation component and the development and demonstration component according to the following criteria:

1. The model's specificity in regard to each of the categories and components within the general model specifications.
2. The proven efficacy of the model during the demonstration phase.
3. The efficient conduct of an educational program specified by the prototypic model.
4. The effective articulation of the model with local situation as indicated by ease, smoothness, etc. of installation and conduct of the model program in local situations.
5. Adequacy of the model to accommodate change.

Program decisions will be made jointly by the development program staff and staff of other programs and/or components of the laboratory as appropriate. The program director will have final responsibility for implementation of such decisions in light of the general goals, objectives, and policies set by the National Laboratory.

Expected end products of results:

End products of this program will be a series of prototypic early childhood education models, the first of which will be targeted for urban deprived four and five-year-old children.

Program time schedules:

The development of the first prototypic model for early childhood education of urban deprived four and five-year-old children will begin immediately with the assembly of data, preparation of materials and the writing of the components. Planning for the prototype testing will proceed apace in anticipation of beginning in September, 1970.

Resources: Resources focus chiefly on staff with a data gatherer, a writer and a demonstration person being needed immediately.

N-HA

Title: Development of Models of Early Childhood Education

Principal Staff: Myrtle Scott, Coordination Center Staff

Purpose, objective, or goals: To develop models of early childhood education derived from the existing data base produced from the work of the National Laboratory and others.

Importance, need, or justification: One part of the overall objective of the National Laboratory has been stated as the development of models of early childhood education. In order to proceed toward this goal, the knowledge and results of applied experimentation generated within the National Laboratory and by outside sources must be synthesized and integrated within the framework of model specifications. These models, then, will constitute the final form in which accumulated knowledge and tested practice is made available for practical application.

Method, strategy, or design: Of first priority during the coming year will be the development of an early childhood education model for four and five-year-old urban deprived children. The first step in the development of this model is the detailing of specifications for the model. Development of these specifications is currently underway within the National Laboratory and will include the following components:

1. Instructional systems.
2. Delivery systems.
3. Evaluation and installation data.
4. Support systems.

Data from the applied experimental research efforts of the laboratory as well as from other sources that have tested model components will then be organized around these specifications and prototypes will be constructed. These prototypes will then be validated in controlled testing situations. Once a model has been developed it will then be made available for practical application through demonstration.

Characteristics of the users:	Users will be practitioners in the field of early childhood education.
Decision making procedures and evaluation design:	Evaluation will be the joint task of the program planning and evaluation office and the development and demonstration office according to the following criteria: 1. The model's specificity in regard to each of the categories and components within the general model specifications. 2. The proven efficacy of the model during the demonstration phase. Program decisions will be made jointly by the model development staff in conjunction with other components of the laboratory as appropriate. The program director will have final responsibility for implementation of these decisions in light of the general goals, objectives and policies set by the laboratory.
Expected end products of results:	An early education model for urban deprived four and five-year-old children.
Program time schedules:	The development of the first prototypic model for early education of urban deprived four and five-year-old children will begin immediately with the assembly of data, preparation of materials and the writing of the components. Prototypic testing will be initiated on or about September 1, 1970.
Resources:	Resources needed immediately are a data gatherer and a writer with appropriate operational support modules for each.

N-HB

Title: Demonstration of Early Childhood Education Models

Principal Staff: Myrtle Scott, Coordination Center Staff

Purpose, objective or goals: To demonstrate in controlled settings those prototypic models of early childhood education which will be developed within the National Laboratory.

Importance, need, or justification: The objective of the National Laboratory has been stated as the development of models of early childhood education. Once a prototype has been developed it will then be made available for practical application. One of the more effective ways to influence practice is through the observation of ongoing programs. Effective personnel in an appropriate setting will translate the model from its abstract form into concrete observable behaviors.

Method, strategy, or design: A comprehensive coherent plan will be developed for implementation of the testing and demonstration of the prototypic model for early education of four and five-year-old urban deprived children. This plan will:

1. Provide for the appropriate conduct of an educational program specified by the prototypic model.
2. Employ staff who are capable not only of demonstrating the model but of articulating the model with local situations.
3. Provide for the continued evaluation of the model.

Further specific strategies will be dependent on the prototype to be developed and the plan for implementing its testing and demonstration.

Characteristics of the users: Users are expected to be practitioners in the field of early childhood education.

Decision making procedures and evaluation design: Evaluation will be the joint task of the evaluation component and the demonstration component according to the following criteria:

1. The efficient conduct of an educational program specified by the prototypic model.

2. The effective articulation of the model with local situation as indicated by ease, smoothness, etc. of installation and conduct of the model program in local situations.
3. The adequacy of the model to accommodate change.

Program decisions will be made jointly by the demonstration staff and other laboratory components as appropriate. The program director will have final responsibility for implementation of these decisions in light of the general goals, objectives and policies set by the laboratory.

Expected end products of results: Results of this activity will be a tested model for early childhood education appropriate for installation under specified conditions.

Resources: Needed immediately are staff to be involved in the planning phase of the demonstration.

ARIZONA CENTER FOR EARLY CHILDHOOD EDUCATION

70706-A

Lab. Cate.	Center Code	Program, Project/Activity Title	Principal Investigator
1.	A-A	Administration	Marie Hughes
2. 2	A-G	Curriculum Research and Development	Marie Hughes
2. 21	-GA	Technical Papers	Marie Hughes
2. 21	-GB	Development of Instructional Resources	Marie Hughes
2. 22	-GC	Planned Variation and Research Implementation	Ronald Henderson
2. 22	-GD	Analysis of Curriculum Process and Effects--Independence as a Parameter of Achievement and Reinforcement	Marie Hughes
2. 11	-GE	Analysis of Curriculum Process and Effects--Effect of Degree of Symbolic Representation of Objects on Meaningful Responses	Marie Hughes
2. 11	-GF	Analysis of Curriculum Process and Effects--The Effect of Novelty on Visual Orienting	Marie Hughes
2. 11	-GG	Hierarchial Analysis of Number Recognition	John Bergan
2. 1	A-H	Environmental Influences and Interactions with Developing Behavior	Ralph Wetzel
2. 13	-HA	Modeling Effects on Program Relevant Behaviors--Observationally Induced Conservation	Ted Rosenthal
2. 13	-HB	Modeling Effects on Program Relevant Behaviors--Observationally Induced Object Grouping	Glen White
2. 13	-HC	Modeling Effects on Program Relevant Behaviors--Modeling; Reinforcement, and Rehearsal Effects on Sharing and Cooperation	Glen White
2. 13	-HD	Effects of Variation in Stimulus Content and Presentation on Recognition	John Bergan

ARIZONA CENTER FOR EARLY
CHILDHOOD EDUCATION

70706-A

Lab. Cate.	Center Code	Program, Project/Activity Title	Principal Investigator
2.22	-HE	Reinforcement Effects on Classroom Behavior	Ralph Wetzel
2.13	-HF	The Effects of Home Environment on Academic Achievement	Ronald Henderson
2.21	-HG	The Effects of Program Implementation on the Natural Environment	Ronald Henderson
2.1	A-I	Individual Characteristics and the Development of Behavior	Sadie Mallory
2.13	-IA	Seriation and Ordination and the Effects on Search Behavior	Sadie Mallory
2.11	-IB	Hierarchial Analysis of Visual Memory	John Bergan
2.12	-IC	Studies of Language	Wayne Carroll
2.2	A-J	The Development and Evaluation of Educational Change Agent Roles	Carol Rubow
2.23	-JA	The Training for Field Representatives	Ronald Henderson
2.23	-JB	Training for Program Assistants	Ronald Henderson
2.3	A-K	Evaluation Techniques and Supporting Technology	Maure Hurt
2.32	-KA	The Development of a Pictorial Test of Cognitive Skills	Barry Zimmerman
2.22	-KB	The Effect of Mode of Presentation on Two Piagetian Tasks	Sadie Mallory
2.13	-KC	Ethnic Variable and Psychoeducational Appraisal	Shitala Mishra

Title: Administration

Principal staff: Marie Hughes, Ralph Wetzel, Ronald Henderson, George Kavina, Linda Murphy

Purpose, objective, or goals: The purposes of the administrative directorate are:

1. Coordination and development of all programs and modules.
2. Maintenance and development of relationships with colleges and departments within the University which contribute personnel to the staff of the Center.
3. Cultivation of additional associations with departments, colleges, and outside organizations to increase and deepen the inter-disciplinary nature of the Center and its penetration and influence within the region.
4. Cultivation of cooperative relationships with the public schools.
5. Coordination with Ochoa, the Research School.
6. The regular duties of administration such as monitoring the expenditures, preparation of budget and reports. Specific staff assignments with later evaluation.

Importance, need, or justification: It is necessary that the Center be articulated with the University structure. Further, it is important to coordinate the Center's R&D effort with other programs especially Follow Through Project.

Method, strategy, or design: The methods used are:

1. Coordination and development of all programs and projects. An asset to coordination is our location in the same place and the proximity to the Psychology Preschool Laboratories. Our project groups are brought together from time to time for reporting purposes.
2. Project members are free to consult across projects.
3. Conferences.

Method, strategy, or design (continued)

4. Planning and evaluation meetings before and after activity.
5. Manuscript reading by several members of staff. Rechecking statistical presentations. Some effort made to identify the specific audience for whom manuscript is prepared.
6. Once a week or more extended visit to the school. One day training and evaluation with the three Program Assistants assigned to the school.
7. General administration. Self explanatory.
8. The administrative assistant handles most matters of general administration, whereas the Directorate deals directly with R&D matters.

Evaluation procedures:

The Center is administratively in the College of Education and subject to review by the Dean of that college. Self-assessment focuses on production, staff growth, the increased programmatic nature of the activities and the integration of working units.

Expected end product of results:

An efficient, dedicated staff with varied interlocking technical skills. All operations promoting the building of a viable, productive Center.

A-G

Title: Curriculum Research and Development

Principal staff: Marie Hughes, Ralph Wetzel, Ronald Henderson, Mary Coxon, Halene Weaver, Sadie Mallory, Shitala Mishra

Purpose, objective, or goals:

1. To produce a series of technical papers designed to explicate the Tucson Early Education Model to teachers and administrators, other curriculum designers, and interested individuals in the allied professions.
2. Development of instructional resources which can be used by classroom personnel in the implementation of the Tucson Early Education Model. These resources include such things as manuals for the preparation of materials, directions in room organization, and other guides for classroom personnel. (See project A-GB)
3. The development of planned variations in the program in order to provide a data base upon which to make programmatic change decisions. This objective automatically necessitates the study of research implementation processes including the training of teachers to maintain experimental design requirements.
4. To begin the identification of significant curriculum processes and components, and to study the effects of these processes on the goal behaviors.
5. To develop basic research findings on particular curriculum areas (e.g., arithmetic).

Importance, need, or justification: As stated earlier, the development of curriculum and total educational program is the focus of the Arizona Center for Early Childhood Education. Hence, this particular program, Curriculum Research and Development, has top priority. All other programs of the Arizona Center feed into this program as described in the strategic plan. The products of this program will have immediate value to those 18 communities using the Tucson Early Education Model in the Follow-Through Project. In addition, the products will hold general interest for anybody interested in this new early education model.

Method, strategy, or design:

The projects of this program represent curriculum research and development at essentially three levels. Level one is the generation of basic research data which, though it may lack immediate application in the classroom, is appropriate to the development of classroom curriculum. This level is represented by Project A-GE. It is a laboratory study. At the second level, research is designed for the classroom and includes the systematic study of selected curriculum processes as they occur in the classroom and the systematic variation of certain curriculum aspects such as materials and organization. This is analagous to research classroom work, and is represented by Projects A-GD and A-GC. At the third level, the data of the research and the laboratory are put in a form suitable for exportation into the field. This is represented by Projects A-GB and A-GA in which certain components of the Model are put in product form. It is the strategy of this Center to attempt to maintain curriculum work at all levels; that is, at the laboratory level, at the research-classroom level, and in the field.

Evaluation procedures:

Since it is an aim of this program to bring a certain degree of congruence between research and classroom processes, it is essential that classroom personnel be involved in decisions concerning the selection of research topics. The selection of program variations, curriculum processes and skills for analysis originate as felt needs by classroom personnel in the field. Assessment is based on the degree to which the data products of each project move from the laboratory end of the continuum toward the field or consumption end of the continuum. For example, the program is reaching a goal when the data of Project A-GG, which is a laboratory project on number recognition, begins to be influential in the research classroom. Likewise, the research classroom products are successful when new methods and procedures begin to appear in the field.

Expected end products of results:

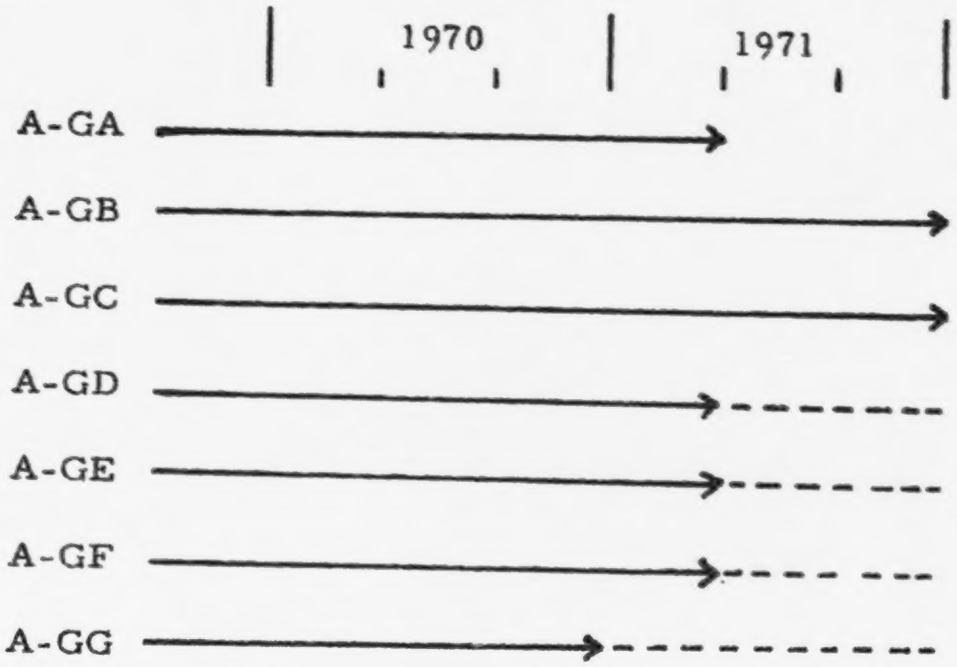
1. A task analysis on number recognition.
2. The identification of at least two processes considered to be important to the curriculum and

Expected end products of results (Continued)

the study of their effects on goal behaviors.

3. The development of reading and mathematics methods and procedures and their systematic comparison.
4. The development of techniques for involving teachers in curriculum change.
5. A series of technical papers and instructional resources on the Tucson Early Education Model.

Time schedule:



Resources:

In addition to the Center staff, certain Follow-Through Implementation program staff will be working on Project A-GG. The Arizona Center will be contributing to that project but will not be funding it entirely. This program will be carried out simultaneously in the Laboratory Preschool, Ochoa classrooms, and selected Follow-Through communities.

A-GA

Title: Technical Papers

Technical papers are defined as those which utilize some concepts or organizational model that are new or applied to an aspect of the program in a fresh and provocative manner. There will be some difficulty in separating technical and research papers. An example is the paper on bilingualism which will express a point of view as well as contain data relating the pattern (English-Spanish) spoken in the home and community to children's achievement.

Principal staff: Marie Hughes, Mary Coxon, Halene Weaver, Sadie Mallory

Purpose, objective, or goals:

1. To present components of the program in depth in such a manner that the rationale for the invariant components is clearly stated as well as the individual components identified.
2. To present an aspect or by-product of the program within a theoretical and, when available, a research orientation that further elucidates the program.
3. To clarify several aspects or components of the program so that their contribution to the theory of instruction may be recognized; also, to present them in such a manner that other workers may incorporate these aspects in their program.

Importance, need, or justification: The Arizona Center for Early Childhood Education has been funded for three years by the Office of Education through the Coordination Center. It has, in addition, had through the University and Tucson District 1 access to substantial funds from Title I of Public Law 89-10. An early childhood education program was developed that later became one of the Follow-Through Models. During the 1969-70 year, the program will operate in 18 school districts in 15 states; the larger cities included are Baltimore, Newark, Fort Worth, Des Moines, Wichita, and Lincoln.

Importance, need, or justification (Continued)

This program is presented as an open-ended process curriculum with which a large number of materials of instruction may be used. It is designed for flexibility which allows for adaptation to specific populations and communities. This major product of the Arizona Center cannot be properly disseminated without supportive technical and descriptive publications.

Characteristics of the users and samples:

The users of these publications will include: directors and teachers of young children and professionals interested in building theories of instruction, commercial enterprises designing equipment and materials of instruction.

Method, strategy, or design:

The curriculum has reached a point of development wherein the invariant components related to the basic premises of the program are known and have been developed sufficiently to explicate them. Such invariants are criteria for choice of content for the technical papers.

Evaluation procedures:

Evaluation will be as a continuing review panel:

Sadie Mallory, Research Associate
Carol Rubow, Director of Training and Research Associate
George Kovina, Administrative Assistant
Ralph Wetzel, Associate Director, in charge of research

Expected end products of results:

The product may be described as an arena, physical and conceptually, in which to inform and train a group of practitioners in the implementation of new goals for the education of growing children. This arena is dynamic, developmental, and open-ended because it includes the children, teachers, parents, aides, and resource people. As a public school the arena is in a context of reality with structure guided by principles that can be acquired cognitively and attitudinally. It does involve the value system of the individual. It can make a difference in the classroom since the

Expected end products of results (Continued)

way to change the educational system is to change the people who operate it. Zarrold Zacharis was asked by Don Davies, Associate Commissioner of Education what advice he had to give now after his long association with new curriculum. This physicist speaking to the Director of the Professional Development Act replied, "Train them (teachers) to treat kids like human beings."

The Tucson Program with its four goal areas is directed toward children acquiring the basic skills and attitudes for continued learning. Individuality in response to school tasks and life style is accepted. Within the arranged environment of the schoolteachers and peers interact in such a way that learning for each individual is facilitated. The four goal areas are developed so that every lesson or unit design encompasses all four. This process is known as orchestration.

The underlying assumption is that the impact of the school is greatest when each element and factor present (interpersonal, intrapersonal, organization, and materials) reinforces and interacts to achieve the major goals.

The technical papers in process or completed:

1. The Professional Response
   Presents the point of view that the teacher is the most important instructional tool. It outlines behaviors that appear to lead to greater efficiency in this role with the rationale for them.

2. The Role of the Program Assistant, With Case Study (completed)

3. The Primary Goals of Early Education
   The paper presents the theoretical basis for statements of goal areas with a series of behavioral objectives linked to classroom practices and content.

Expected end products of results (Continued)

4. Individualization, Grouping, and Interaction

5. Local Environment and Content

6. The Mexican-American Child and Bilingualism: A Point of View
   This paper will include some data from our research.

7. Conditions that Impede or Facilitate New Curriculum in Primary Schools

Note: The listed papers will probably become chapters in two major publications:

The University of Arizona and Tucson District No. 1 Cooperative Project 1965-68

Early Education Program: Today and Tomorrow

Language Papers: These papers are largely completed and will eventually become a book.

8. The Natural Method of Language Teaching; Systematized and Accelerated
   An initial manuscript of three hundred pages has already been written.

9. Intellectual Implications of the Use of Prepositions and Conjunctions (completed)

10. Language Analysis of Children's Dictated Work

11. Transformation and Sentence Combinations

Resources:

The most needed resource is Time. An expert manuscript typist must be secured and the people already listed must remain free enough from other assignments to contribute as planned.

A-GB

Title:	Development of Instructional Resources
Principal staff:	Marie Hughes, Mary Coxon, Halene Weaver, Sadie Mallory
Purpose, objective, or goals:	A series of classroom examples of successful work with the objective of presenting to teachers examplary materials that may suggest additional types of activities and content. We shall design these papers to insure depth in the content and relatedness to specific objectives within the goal areas. These papers are written with a foreward that places the materials within the framework of the Early Education Program. In other words, care is taken to prevent any material from becoming a recipe.
Importance, need, or justification:	Teachers are encouraged when actual classroom work is presented. There is need, however, to link such records with the theoretical rationale of the program. A continuous flow of such publications should reflect the open-endedness and further development of the program.
Method, strategy, or design:	Care will be taken to report classroom practice that includes actual records of children's work. In addition, the report will make explicit the relationship to the practice to accepted objectives within the goal areas.
Characteristics of the users and samples:	Classroom teachers and program assistants will be the ultimate users.
Evaluation procedures:	Evaluation will be as a continuing review panel: Sadie Mallory, Research Associate Carol Rubow, Director of Training and Research Associate George Kavina, Administrative Assistant Ralph Wetzel, Associate Director, in charge of research

Expected end products of results:	1. A Cooking Experience: Case Study of Orchestration (completed) 2. Reading: A Case Study (completed) 3. Mapping: An Introduction to Symbols 4. Mathematics in Everyday Life of Young Children 5. A series of papers involving many people but conceptualized by Hughes pertains to the theory and use of the so-called "Intellectual Kits."
Resources:	Again, Time and proper support in an expert typist, illustrator and layout man, and money for appropriate publication costs.

A-GC

Title: Planned Variation and Research Implementation

Principal staff: Ronald Henderson, Ralph Wetzel, Shitala Mishra

Purpose, objective, or goals:

To determine if different procedures and materials for the teaching of reading systematically varied in selected Follow-Through classrooms, result in differential skill acquisition when incorporated into the Tucson Early Education Program.

To determine if different procedures and materials for the teaching of arithmetic systematically varied in selected Follow-Through classrooms, result in differential skill acquisition when incorporated into the Tucson Early Education Program.

To determine if direct, formal instruction in reading skills adversely effect the attainment of the program's goal category of "motivational base."

To determine if direct, formal instruction in arithmetic skills adversely effects the attainment of the program's goal category of "motivational base."

Importance, need, or justification:

The Tucson Early Education Program has been developed within the framework of an internally consistent rationale derived from the theoretical and empirical literature in child development, learning theory, curriculum development, and related areas. This is a major strength of the program, and it seems clear that some aspects of the curriculum must be held invariant if the basic assumptions underlying the program are not to be violated. On the other hand, if the program is to remain vital, it must be subjected to continual empirical evaluation to determine what aspects of the curriculum may be improved upon. This may be done by systematically varying some aspect of the program which is not clearly invariant. Through the comparative analysis of the results of such planned variation, the program may be made more effective.

It is possible that a variant procedure may produce favorable results for the specific behaviors on which

Importance, need, or justification (continued)	it focuses, but have unintended and adverse effects in some other goal area. Reading and arithmetic are two curriculum areas in which it is not clear how a modification of the present procedures might affect the overall growth of children in the four major goal areas of the program. Users of the program are somewhat divided in their opinions concerning the possible intended and unintended outcomes of more formal skill instruction in reading and arithmetic. If the objectives of this project are met, we will come somewhat closer to an answer to this question.
Method, strategy, or design:	Communities using the Tucson Early Education Program will initiate the request for implementation of a variant of the reading or arithmetic program. In one community, for example, parents have insisted that an individualized skills program which they judge has been successful, be incorporated into the Follow-Through Model. Options will be restricted to individualized approaches in order to stay within the rationale of the Model. In a few communities it will be possible to introduce the variant program into some Follow-Through classes and not into others. In these cases, the classes not using the variant procedures can be used as control groups in an experimental design. In other cases, all Follow-Through classes in the community will use the variant procedures. In such cases, subjects will be matched as closely as possible on relevant criteria with subjects in a community not using the variant.
Characteristics of the users and samples:	The samples will consist of disadvantaged first and second graders, of varied racial and ethnic backgrounds, in selected Follow-Through classrooms in which varied approaches to the teaching of reading or arithmetic skills will be implemented. Users of the outcomes of the varied approaches will be school systems using the Tucson Early Education Program.

Evaluation procedures:

Data on subjects in classrooms using a variant of the reading program will be tested at the beginning and at the end of the year with the California Reading Test. Subjects in classrooms using a variant of the arithmetic program will be tested at the beginning and at the end of the year on the arithmetic test of the California Arithmetic Test. In addition, a developmental effort will begin to explore ways of monitoring specific individual progress in order that future investigations may not need to depend on a pre-post testing design.

Motivational base will be measured in this project through the use of observational scales designed to secure data on children's use of books or number and measurement materials during free choice period. If motivation for reading or arithmetic is adversely affected by direct formal instruction in these areas, then this should be reflected in lower frequency of voluntary use of the relevant materials. It is equally probable that skill instruction would lead to greater competence which would result in greater use of these materials.

The statistical analysis will consist of a treatment by levels analysis of variance if the correlation between the pre- and post test is less than +.55 (see Feldt, Psychometrician, 1958). If the correlation is more than +.55, an analysis of covariance will be used.

Expected end products of results:

Anticipated products of this project are:

1. A research report on the effects of planned variation in the instruction of reading and arithmetic on skill acquisition in these areas, and on motivation to read or use arithmetic materials.
2. An observational checksheet and accompanying instructions for the assessment of frequency and task persistence in the use of arithmetic and reading materials.

Expected end products of results (continued)	3. A description of record keeping procedures for monitoring individual pupil progress in skill acquisition.
Resources:	Staff for planning and coordinating; a researcher with classroom experience; research assistants for data analysis and preparation of materials, a graduate assistant, secretarial assistance, and equipment (event recorders).

A-GD

Title: Analysis of Curriculum Process and Effects--Independence as a Parameter of Achievement and Reinforcement

Principal staff: Marie Hughes, Sadie Mallory

Purpose, objective, or goals:

Fostering increases in independency behavior is one of the general goals of education (Inlow, 1966). Yet it appears that minimum research evidence exists of the effect in the classroom of this organismic dimension. Moreover, there seems to be limited information on how teachers can effectively develop independence. Consequently, there are many questions which can be raised about independency which are relevant for education.

The educational program of ACECE includes several instructional practices which require the child to be independent and which intuitively foster acquisition of independency behavior. It then is worthwhile for this project to attempt to isolate and evaluate this variable:

1. To develop an effective instrument for measuring independence.
2. To determine the pattern of dependence--independence for individuals.
3. To determine shift toward independence.
4. To determine the association between independency and school achievement.
5. To determine the effect of independency on the valence of certain reinforcers.
6. To evaluate effective methods of instituting and expanding independency behavior.
7. To isolate and measure self-initiated educational acts as a facet of independence.

Importance, need, or justification:

Independency has been studied most often as the inverse behavior of dependency. Many of these studies have assessed this interpersonal behavior as a facet of the mother-child interactional system in the home (see Mussen, 1960). Sears, Whiting, Nowlis, and Sears (1953) evaluated the dependency of nursery

Importance, need, or justification (continued)

school children finding that girls were more dependent toward teachers than boys. Gewirtz (1956) described dependency behavior under controlled conditions of two levels of adult availability. More dependency behavior was elicited when the adult was not readily available to the child.

Reward of dependency responses as an antecedent variable has been studied by Nelsen (1960) and Cairns (1962). Reward for dependency resulted in increased dependency responses. Cairns (1962) following the experimental treatments in which reward was varied across groups, found that children learned a discrimination task more rapidly if they had been reinforced for dependency. This result suggests that high dependent children are more responsive to social reinforcers.

Method, strategy, or design:

This research will initially attempt to describe independency and to relate this organismic variable to other dimensions of schooling, namely academic achievement. The achievement measures will be those which the Center has selected to measure school progress.

Subsequent to the descriptive phase, experimental designs varying kind of reinforcement will be utilized. Also, the influence of independence as an antecedent variable will be studied. The experimental studies will vary along the laboratory to in-the-classroom loci of research. Independence will at times be the dependent variable and at other times be the independent variable. When independence is the independent variable, groups will be matched on as many relevant variables as possible.

As an example of the projected in-the-classroom experimentation, high and low independency Ss will be administered a given social verbal reinforcer contingent upon a specific type of language pattern. The change in this behavior will be measured across trials.

Characteristics of the users and samples:	The samples will be composed of low income children who are being instructed in classes utilizing TEEM. Initially this sample will be confined to first and second grade children. Pilot laboratory tasks will be conducted employing children attending the Research School. These children will be predominantly Mexican-American.
Evaluation procedures:	Appropriate correlational, parametric, or nonparametric procedures will be applied to the data.
Expected end products of results:	It is expected that this research program will result in an effective objective measuring device of classroom independence. Further, this instrumentation is expected to provide opportunities to evaluate (and subsequently information on) certain relevant aspects of the schooling program.
Resources:	Primary staff plus a testing team, statistical analysis staff, secretarial assistance, and training equipment and materials (tests).

A-GE

Title: Analysis of Curriculum Process and Effects--Effect of Degree of Symbolic Representation of Objects on Meaningful Responses

Principal staff: Marie Hughes, Sadie Mallory

Purpose, objective, or goals: Many theoretical constructions of the learning progression describe this movement as being from the concrete to the abstract. If one assumes abstract to be symbolic representations which vary in degree of removal from the actual object, then it is possible to assess the effects of symbolization when concreteness is retained. The question for education is at what approximate age can abstract representations be used in training and not inhibit progress. Such a question appears to be particularly relevant for educational programs servicing large numbers of children who are acquiring the publicly accepted labels and categories in the dominant language.

1. To assess the effect of three levels of representation on labeling and classificatory behavior of three age groups.
2. To evaluate the relationship between training on levels of representation and generalization to the actual object.

Importance, need, or justification: Siegel (1954) has tested the independence of meaning and level of symbolization and found that level of symbolization did not affect the meaning imposed on the stimuli. He used lower socio-economic white boys who were 7, 9, and 11 years of age. In another study reported by Siegel (1967), it seems that meaning applied to objects was affected by the level of symbolization for younger low income children. He found a significant difference in consistency of classifying pictures as compared to life-sized objects for these children.

Method, strategy, or design: Stereometric objects, real and miniature, and planometric representation of the same objects will be presented in a counterbalanced design in the developmental study. S will be instructed to label the objects

Method, strategy, or design (continued)

as E presents them. E will classify the objects and instruct S to state the basis for the grouping.

Ss will be trained to label 15 objects which are presented stereometrically and planometrically to a criterion of two correct consecutive trials. The actual object will be presented and S will be instructed to label it.

Characteristics of the users and samples:

1. First Study: Sixty children divided equally among kindergarten, first grade, and second grade will be the Ss. These children will be Mexican-American for whom Spanish is frequently spoken in the home.

2. Second Study: Thirty kindergarten children divided equally between the sexes will be Ss. These children will be predominantly Mexican-American.

For both groups, the Ss will be low income.

Evaluation procedure:

Appropriate ANOVAS will be applied to the data.

Expected end products of results:

This study is expected to give meaningful information on when pictures can be effectively used by teachers for instructional purposes.

Resources:

Primary staff, a graduate assistant, secretarial assistance, and training equipment and materials.

A-GF

Title: Analysis of Curriculum Process and Effects--The Effect of Novelty on Visual Orienting

Principal staff: Marie Hughes, Sadie Mallory

Purpose, objective, or goals: In Piaget's theory, assimilation is the process which enables incoming information to be incorporated into already existing internal structures, i.e., the incoming data can be associated with previous learning. When the environmental data is so unfamiliar (i.e., novel) that it cannot be absorbed into existing assimilatory schemas, some form of cognitive conflict occurs. According to this conception, novelty induces cognitive conflict. Such conflict has been described as a motive force activating instrumental behavior which selectively intensifies stimulation from the stimulus field or which establishes contact with stimuli beyond the current field (Berlyne, 1965). Visual orienting is an instrumental act which intensifies stimulation from the stimulus field and this conceivably would be evoked by novel objects. However, when an organism is confronted by a conflict-inducing stimulus, withdrawal (or visual disregard) is one technique for alleviating conflict.

Novelty can vary on a familiarity continuum. It may be that the degree of novelty determines whether it motivates approach or avoidance behaviors. This study explores the influence of objects, which exist in reality and are available through visual mechanisms, that differ in degree of familiarity on visual orienting. Specifically the current research hopes to discover if there is a value of novelty beyond which visual disregard occurs and the level of novelty which elicits approach behavior.

1. To determine the relationship between degree of novelty and visual orienting.
2. To determine the effect of novelty for inducing motivational behaviors which a teacher may effectively utilize for instructional purposes.

Importance, need, or justification:

Pre-first grade children have been found to prefer the least familiar objects in the environment when familiarity was defined by recency of exposure. Cantor and Cantor (cited in Cantor, 1963) found that kindergarten children preferred significantly the geometric forms to which they had not been exposed during familiarization treatment. Mendel (1962) found that as novelty increased the number of experimental subjects selecting the novel arrays increased. Degree of novelty in the arrays was accomplished by manipulating the number of toys with which a *S* played during the "habituation" period.

Method, strategy, or design:

Five classes of objects each containing approximately 30 items will be generated. Pictures of these objects will be presented to the 100 *S*s who will designate the degree of familiarity on a scale of: seen all the time, most of the time, some of the time, few times, and no times. This assessment will be obtained individually with *E* recording the responses. The item's familiarity will be established by the per cent of children responding to it in a particular direction. By this method, four degrees of familiarity will be identified for the objects within the classes.

Four objects which vary in familiarity within the same class will be presented simultaneously to *S*. Each class will be presented twice using differing sets of four objects. *S* will receive ten novelty trials. Visual orienting will be recorded by an eye movement machine and duration of orientation will be recorded by some timing device. Through pilot testing, time limits or exposure will be established or *S* will be permitted to determine the time of exposure for each set.

Characteristics of the users and samples:

The sample will be composed of 80 Mexican-American (predominantly) first grade pupils divided equally between the sexes. Another sample of similar children will be used to establish the degree of familiarity of the objects. This sample will contain a minimum of 100 *S*s.

Evaluation procedure:	The effects of novelty attractiveness will be measured on the first response. This will be assessed by a group by treatment design. Duration of visual orientation will be evaluated by a repeated measure on two factors design.
Expected end products of results:	This experimental study is expected to yield results which imply the efficacy of teachers placing novel elements in the environment for inducement of approach behavior.
Resources:	Primary staff, two research assistants, secretarial assistance, eye-movement equipment and materials and cooperating schools.

Title:	Hierarchical Analysis of Number Recognition
Principal staff:	John Bergan, Dal Curry, Elaine Nicholson, supported by Follow-Through funds
Purpose, objective, or goals:	The purpose of the project is to validate a hierarchy of perceptual skills underlying number recognition.
Importance, need, or justification:	Perceptual training programs currently in use in the schools provided instruction in abilities which are not necessarily essential to school learning. That is, there is no direct relationship between mastery of perceptual skills and acquisition of academic skills. The present project seeks to determine a set of perceptual skills which could be used in a perceptual training program and which would be determined to be essential to number recognition. Gagne has done extensive pioneering work in the area of validating learning hierarchies. Resnick has extended this work to consideration of learning in preschool children.
Method, strategy, or design:	Children would be tested to determine ability to perform recognition tasks at each level in the proposed hierarchy. Children not passing at a given level would be trained to perform at that level.
Characteristics of the users and samples:	One hundred preschool children would participate in the project.
Evaluation procedure:	The criteria used for mastery at a given level would be 90 per cent of the children passing 90 per cent of the items at a given level. The hierarchy would be validated to the extent that it could be shown that children who had not mastered a given level could not perform successfully at higher levels in the hierarchy.
Expected end products of results:	Results of the project would be disseminated through publication in a professional journal and an Arizona Center publication and through consultation service

Expected end products of results (continued)	provided by school psychologists in the Follow-Through Implementation Program.
Resources:	Follow Through funds for staff and National Laboratory funds for data analysis, supplies, and materials.

A-H

Title: Environmental Influences and Interactions with Developing Behavior

Principal staff: Ralph Wetzel, Ronald Henderson, Shitala Mishra, Sadie Mallory

Purpose, objective, or goals:

1. To study the affects of the processes of modeling, cueing and reinforcement upon target behaviors of the Tucson Early Education Model.
2. To study the relationship between the home environment and classroom behavior and to compare cultures with respect to their relationship to the educational process.
3. To study the impact of new educational program upon the community and home milieu.

Importance, need, or justification: This program is the core of the curriculum related research. This program involves the study of the curriculum processes and their effects on the stated curriculum goals. Initially the program emphasizes the *basic environmental* variables of modeling, discrimination and reinforcement. In addition, we are studying the effects of broader and more complex environmental influences such as the home environment as well as the interaction between the school and home culture.

Method, strategy, or design: As in the other programs, we are attempting to develop work at different levels of activity. Projects A-HG and A-HD represent work at the laboratory level while Project A-HE studies reinforcement effects in a research classroom setting. Projects A-HF and A-HG are field studies. It is one general strategy to move the findings at each level to the next level. For example, the findings on reinforcement effects in the Preschool *Laboratory* last year will be used in the development of a functioning *classroom* in this proposal. As data on modeling effects are generated by the basic research, studies of modeling within the classroom itself will be devised.

Expected end products of results:	The data from this program will feed directly into curriculum research and development. The specific forms or the end products or results are described in the project resumes.
Time schedule:	Modeling studies in the laboratory, 1970; adapted to curriculum, 1971; other studies have two year minimums.
Resources:	Some Follow-Through staff will devote time to four of the projects. In addition to the principal staff, graduate assistants, research assistants, and secretarial help will be contributed by the center.

A-HA

Title: Modeling Effects on Program Relevant Behaviors--Observationally Induced Conservation

Principal staff: Ted Rosenthal

Purpose, objective, or goals: This study will attempt to modify a child's conservation of number behavior through a model's conservation number behavior. In addition, the child's conservation number behavior will be tested on new stimuli to ascertain whether the response generalizes.

Importance, need, or justification: Although the paradigmatic effect of teacher behavior has long been assumed, there has been little systematic investigation of modeling variables until recently. Educators have long expressed an interest in student acquisition of intellectually-oriented behaviors. Indeed these intellectual behaviors constitute one of the major goals of the Arizona Center for Early Childhood Education. The importance of conservation responses have been elaborated by Flavell and there is some evidence to suggest that these conservation behaviors may be related to intellectual functioning. Since the development of higher intellectual functioning is the charge of the school, the efficacy of the modeling technique in facilitating this end is of direct importance.

Method, strategy, or design: The subjects will be taken individually into a separate room and will be shown a series of 12 conservation items and will be instructed to state whether equality of number exists in the case of each item. The children will then be assigned to one of four groups: three treatment groups and one control group. The three treatment conditions will consist of:

1. Observing the model only,
2. Observing the model and hearing of the rule,
3. Observing the model, hearing the rule, and receiving feedback.

The treatment subjects will then go through the same 12 conservation items the second time to

Method, strategy, or design (continued)	ascertain whether the responses have been acquired. The control group, receiving no model presentation, will simply go through the initial 12 items the second time then all groups will go through 12 new items to determine whether the conservation responses will generalize a new stimuli.
Characteristics of the users and samples:	The sample will consist of 80 randomly selected subjects: 40 males and 40 females from a Head Start center in Tucson, Arizona.
Evaluation procedure:	The conservation of number treatments will be compared with one another and with the control group to ascertain the effect of the model alone and when coupled with the additional cues. This will be accomplished through a completely randomized four-celled design, with the significance level specified at .05.
Expected end products of results:	It is anticipated that the social transmission of conservation number behaviors will be shown to be an effective way of changing a child's conservation and number behaviors. The study is also anticipated to indicate malleability of conservation of number behaviors. Such procedures may be integrated into curricula such as that of the Tucson Early Education Model.
Resources:	National Laboratory provides part-time secretary, data processing, and supplies. Follow-Through supports staff.

A-HB

Title: Modeling Effects on Program Relevant Behaviors--Observationally Induced Object Grouping

Principal staff: Glen White

Purpose, objective, or goals: The studies will investigate the effect of an adult model's object grouping responses upon subsequent child grouping behaviors. Three rule-governed classes will be modeled: function uses, causal relationships, and color of stimuli. In addition, the influence of the verbal presentation of the rule used for grouping by the model will be investigated.

Importance, need, or justification: Curiously little research in the social learning tradition has been directed toward concept formation or abstract categorization. Traditionally, issues of selecting and grouping, and the evolution of cognitive classification (e.g., the abstraction of common stimulus properties from different objects) have been the concern of maturationally-oriented scholars (vide Baldwin, 1968). Emphasis in these studies was the developmental description of cognitive strategies and little attention was directed toward the modification of these behaviors. Bandura and McDonald (1963) have shown that modeling can influence a child's moral judgments toward criteria different from his original disposition. More recently, social language research has demonstrated modeling changes in the use of passive and prepositional linguistic constructions (Bandura & Harris, 1966; Odom, Liebert, & Hill, 1968) and in the parameters of verb tense and kernal sentence-structure (Carroll, Rosenthal, & Brysh, 1969). The emphasis of all the foregoing experiments has been to demonstrate that particular linguistic structures or judgmental criteria were subject to social modification; attention was not directed to alternative conceptual grouping-dimensions by which organize newly-encountered stimuli.

Method, strategy, or design: All children will be shown 12 instances of three objects. Two of the three objects will be alike in function, two in color, and two should be related

Method, strategy, or design (Continued)	causally. The child will be asked to group the two objects that are alike. Afterward, the child's baseline for grouping will be determined. The children will then be divided into four groups. Three of the groups will observe a model go through the initial 12 items grouping them according to one of three rules. The remaining group (control) will observe no model but instead will go through the initial 12 items a second time. Half the Ss in each treatment condition in addition to observing the model will hear the model verbally indicate the rule for grouping. In the control condition, the E will tell half of the Ss that many children had employed a rule for grouping. Then all Ss will go through 12 new instances of objects (similarly constituted) to assess the generalization of grouping behaviors.
Characteristics of the users and samples:	The sample will consist of 160 third-grade children from Tucson, Arizona.
Evaluation procedure:	The data will be analyzed using a 5 x 2, two-way analysis of variance design of percentage gain scores on the modeling and generalization phases of the experiment.
Expected end products of results:	It is anticipated that the results of the study will be published in a professional journal and the results will be disseminated to the National Lab and Follow-Through communities using the TEEM.
Resources:	From National Lab, data processing, supplies, and materials.

A-HC

Title: Modeling Effects on Program Relevant Behaviors--Modeling; Reinforcement, and Rehearsal Effects on Sharing and Cooperation

Principal staff: Glen White

Purpose, objective, or goals: The purpose of the proposed project will be to investigate the nature of the relationship among model observation, reinforcement, and social rehearsal. Resenhan and White (1967) and White (1967) found that among fourth and fifth grade children model observation, per se, failed to significantly influence donating behavior; however, when model observation was combined with the opportunity to publicly rehearse the donating act, subsequent private donations increased markedly, despite the fact that the social rehearsal was in no way explicitly rewarded.

Importance, need, or justification: The parameters of the interactions among observation, reinforcement and rehearsal have not as yet been systematically determined. As interesting as the fact that we sometimes imitate models is, most of the time we fail to imitate the models we observe. Clearly, when the observed act results in noxious consequences to the performer, there is nothing behaviorally compelling about observing the model. The above cited research indicates, however, that the combination of observation with social rehearsal can, under some circumstances, overcome reinforcement considerations.

Method, strategy, or design: It is expected that by studying the combined and separate effects of observation, reinforcement and rehearsal on a variety of learning tasks and games (which would vary in complexity and reinforcement value) a clearer picture of the principles underlying social learning and social influence will emerge.

Resources: From the National Lab, data processing and supplies and materials only.

Title: Effects of Variation in Stimulus Content and Presentation on Recognition

Principal staff: John Bergan supported by Follow-Through funds

Purpose, objective, or goals: To investigate the influence of training on content associated intra-individual differences in recognition of visual stimuli flashed on a screen and followed by masking stimuli. Three types of content would be used: verbal (words), quantitative (numbers), and figural (lines presented in varying positions).

Importance, need, or justification: The project is based on the assumption that content associated differences in recognition ability are a function of learning history. For example, some children may have had experiences which facilitate skill in word recognition, but may have lacked experiences enhancing recognition of numbers. Beyond this, it is assumed that for each child, independent of content, there is a relatively stable recognition ability. It is hypothesized that training will reduce intra-individual differences associated with content. That is, the correlation among tests of recognition differing only in stimulus content will increase significantly as a function of training.

The project is part of a group of studies to assess the effects of training on the acquisition of abilities relevant to school learning. Ability to recognize stimuli presented under backward masking conditions has been found to be highly related to academic achievement (Bergan, 1967; Bergan and Nicholson, 1968; and Gilbert, 1959). However, the magnitude of relationship has been shown to be related to the content of the stimuli presented. Performance with verbal and numerical stimuli is more highly related to achievement than performance with figural stimuli.

The importance of content-associated individual differences in recognition ability is perhaps best appreciated when it is considered within the larger

Importance, need, or justification (Continued)	context of the problem of defining human abilities. The influence of content on the definition of human abilities has represented a serious problem in educational psychology since before Thorndike. In the early days of psychology it was assumed quite reasonably that human abilities could be defined in terms of intellectual processes capable of operating on almost unlimited types of stimulus content. For example, it was argued that if a child could learn to reason logically in one subject matter field, he could then apply his acquired reasoning powers with success in other subject matter fields. Assumptions such as this have been put to the test in research on countless occasions and almost without exception have failed to be validated. Because the role of content in defining abilities has not been determined, the extent to which abilities can be applied to a variety of situations is not known. The present study would be a step toward determining the role of content in defining recognition ability.
Method, strategy, or design:	Children would be given recognition tests differing in content before and after training. Training would consist of 15 practice periods three times a week for three weeks with recognition tasks like those used in the pre- and post tests.
Characteristics of the users and samples:	Approximately 100 third grade students would participate in the study.
Evaluation procedure:	Correlations among pretests and among post tests would be computed. Fisher Z transformations of these correlations would be used in an analysis of variance to test the hypothesis that correlations among post test measures will be higher than correlations among pretest measures.

Expected end products of results:	It is anticipated that this project will eventuate in a journal publication and in a paper for distribution through the National Laboratory.
Resources:	From National Laboratory, data processing and supplies only.

A-HE

Title: Reinforcement Effects on Classroom Behavior

Principal staff: Ralph Wetzel, Rachel Burkholder, Marian Martin

Purpose, objective, or goals:

The Laboratory Classroom will focus on the analysis and modification of the behavioral repertoires of children who would ordinarily fail to be maintained in the first grade, and to affect integration of these children into a first grade classroom. These will be children who present pronounced examples of behavioral deviancy in one or more of the areas designated as Instructional Goals in the Tucson Early Education Model (Annual Report, pages 7 and 8). These include language development, the intellectual base, and societal arts and skills.

Within the overall project goal there will be three main subgoals:

1. Systematic study of the behavioral repertoire in the specified areas, including the nature of deficits and assets, relationships of behaviors to one another, and techniques of assessment.
2. Development of intervention methodologies using shaping, cueing, and reinforcing for acquisition and elaboration of behaviors, and techniques of assessment of behavior changes.
3. Development of methodologies for long term maintenance of the behaviors in the classroom.

A final objective is the development of a prototype classroom within this school system which could be maintained in any school, whose function would be to assess, initiate and supervise intervention in behavioral/learning problems of children from regular classrooms in the school or a nearby cluster of schools. Classroom staff would train parents and teachers to carry on programs developed in the special classroom, and provide ongoing assessment. Such a classroom would constitute a resource for teachers in evaluation, program individualization including the planning of special programs to meet needs of individual children, and for classroom management of children with such special problem requirements.

Importance, need, or justification:

A brief review of relevant literature appears on pages 15 through 19 of the paper, Behavioral Research Relevant to the Classroom, by Marian Martin, April, 1969

Method, strategy, or design:

Research assistants will record behaviors for each child in the school and in the home. Multiple baselines will include appropriate behaviors already in the child's repertoire, inappropriate behaviors, and behaviors which should occur but are lacking and which must be developed and established.

Interviews with teachers and parents will supplement and, to some extent, guide behavioral observations. Teachers will be asked how the child's behavior needs to change in order for him to function successfully in her classroom.

Behavioral records will be continued in the laboratory classroom.

As determined by behavior observation, teacher and parent interviews, the laboratory teacher and staff, and testing, behavior goals will be set for each child. Reinforcement techniques will be used and their effects analyzed. Children will be taught to carry on independent activities within the classroom on individually designed programs. Research assistants will train parents to reinforce new behaviors, assist in training the child, develop goal home behaviors, and in general to support and extend program goals. Data will be collected on behavior changes and used in an ongoing assessment of results.

Research assistants will work with the laboratory teacher, the homes (parents and others), school administrators, and regular classroom teachers to prepare for the child's integration into the classroom. They will continue to collect follow-up data in the school and home and will be available to consult on problems that may arise. Measures of parent and teacher evaluation and attitude will also be collected.

Method, strategy, or design (continued)

In addition, behavioral observations and some preliminary assessment will be made on children in the district who will not be assigned to any other program. Follow-up will be collected on these children when they re-enter the first grade, typically in the fall of the following year. Reintegration of children from the laboratory classroom into regular classrooms will allow the inclusion of additional children into this classroom, diversifying the problems handled.

Characteristics of the users and samples:

Sample: Children in the laboratory classroom will be a sample of those children in the school district who would not be allowed to remain in their first grade classrooms because of their failure to demonstrate appropriate academic and/or behavioral skills.

Users: Evenutal users would include not only those children who would be excluded from first grade attendance, but those who might be allowed to remain because of lesser severity of their behavioral problems, such as many disadvantaged children, disruptive children, "slow learners," and children characterized as "immature." Such children are often retained in the first grade or are promoted without full benefit of the school programs provided.

Evaluation procedure:

Assessment will be that of functional analysis of behavior, an individual or within subject design, using multiple baselines and, where applicable, contingency reversals. Correlational analysis will be included to investigate relationships among behaviors.

Other measures may include the I. T. P. A., Wepman, Metropolitan Reading Readiness Test, and Van Alstyne Picture Vocabulary Test, Peabody materials, related reading materials, Direction and Memory Test (Burkholder), and Visual Discrimination Test (Burkholder). These measures will be employed diagnostically and as an assessment of progress, but not as measures of program outcome.

Expected end products of results:	1. Systematic information on various behavioral deficits, their relationship to one another, and their modification. 2. Prototype of special classroom 3. Assessment methods, instruments 4. Behavior observation instruments 5. Parent and teacher training methods, instruments 6. Training/demonstration facility
Resources:	Laboratory Classroom, University of Arizona, Department of Psychology; educational materials including incentives, observation and recording forms, and apparatus; a teacher furnished by Tucson District #1; a graduate assistant; and a research assistant.

A-HF

Title: The Effects of Home Environment on Academic Achievement

Principal staff: Ronald Henderson, Ralph Wetzel, Sadie Mallory, Shitala Mishra

Purpose, objective, or goals: The purposes of this project are:

1. To develop measures which can be used to diagnose the characteristics of the home environments of individual children.
2. To develop procedures for the collection of descriptive data on the teaching-learning styles and contingency systems which operate in different cultural groups.
3. To produce comparative descriptions of the teaching-learning styles and contingency systems characteristic of selected subcultures.
4. To identify relationships between environmental variables and measures which reflect educational objectives of the Tucson Early Education Model.
5. To determine if interaction effects exist between environmental variables and program characteristics.
6. To determine if children from different ethnic backgrounds differ in ability patterns or in the characteristics of their home environments, and to examine relationships between these two classes of variables.

Importance, need, or justification: Investigations by Davé (1963), Wolf (1964) and Henderson (1966, 1969) have demonstrated that environmental variables which focus on behaviorally defined events in the natural environment display substantial relationships to measures of intelligence and academic achievement. Data in these investigations were based on parent report, using a focused interview schedule and a series of rating scales. A logical extension of this work would be the development of environmental measures having diagnostic value. Data could then serve as a guide to the design of intervention programs to enhance the natural

Importance, need, or justification (Continued)

environments of children whose home environments do not support school related learning. This necessitates further developmental work on the instruments for assessing home environments. It also requires that the instruments be redesigned to cast the variables into a framework that is more systematically related to learning theory. Alternative forms of the instruments should also be tested in order to identify the most efficient means of measuring the environmental variables.

It has also been demonstrated that ability patterns differ for different ethnic populations (Lesser et. al., 1965, Mental Abilities of Children from Different Social Class and Cultural Groups). Work has not yet been done to determine if these differences in ability patterns can be related to differences in the learning environments provided in the home. Work should be undertaken to determine if environmental measures currently available are capable of identifying such differences if they exist. At the same time, work should be done to identify cultural differences that would not be reflected by these instruments. For example, there is a need for descriptions of the processes of cultural transmission in different ethnic groups, focusing on the teaching and learning styles (behaviors) which are characteristic of each population, and on the identification of the contingency systems which operate in the culture. This information would have value for the design of parent involvement programs, as well as yielding information which might suggest changes in school curricula that could capitalize on the behavioral repertoire with which children from a particular population are likely to enter school (e. g., see Gallimore and Howard, 1968, Studies in a Hawaiian Community).

Initial data would be obtained through participant observation. Once the range of potential variable has been identified and described, there will be an attempt to incorporate these variables into the environmental measures under development.

Method, strategy, or design:

Completed work at this Center has demonstrated that environmental measures have both concurrent and predictive criterion-related validity, where criterion measures consist of I. Q. 's or achievement scores. The instrument used in these investigations will be redesigned to yield data on variables more directly related to a learning theory framework, and alternative forms of the interview schedule will be tested to determine the most efficient means of obtaining the environmental data. Environmental data related to objectives 1, 4, 5, and 6 will be collected through parent interviews. Data related to objectives 2 and 3 will be collected through participant observation and depth interviews with informants utilizing the principles of functional analysis of behavior. Individual performance data will be obtained through group and individual testing. Since the independent variables consist of factors in the material environment, the method is best described as a natural experiment.

Characteristics of the users and samples:

Samples: Target samples will consist of children and their families in selected ethnic groups served by schools using the Tucson Early Education Model in their Follow-Through programs. Samples of Mexican-American, Negro, American-Indian, and Anglo-American subjects will be selected. Where classes of comparable children attending classes employing a traditional curriculum are available, they will be used as controls, to determine if there are interaction effects between environmental and program variables.

Users: Users of the instruments and methods developed in the investigation would include school personnel and researchers engaged in the design of programs to ameliorate home environments, with the aim of producing a more adequate learning environment. The data yielded by such instruments would also be useful to curriculum designers attempting to provide more suitable school experiences for children from culturally different backgrounds.

Evaluation procedures:

Data obtained with the revised environmental measures will be factor analyzed to determine if data elicited with the instrument load on the postulated learning categories. Each identifiable factor will be correlated (multiple R) with the criterion measures. Criterion measures will consist of items selected from the instruments used by Stanford Research Institute in the National evaluation of Follow-Through. Items used will be those identified by a panel of judges as being most relevant to TEEM program objectives. Data will also be subjected to an achievement measure x environmental measure x program analysis of variance procedure. Analysis of variance procedures will also be used to examine differences in ability patterns and environmental characteristics of the various ethnic groups. The functional analysis of the natural environment will follow procedures for research in the natural environment suggested by Tharp and Wetzel (Behavior Modification in the Natural Environment) and Gallimore and Howard (Studies in a Hawaiian Community).

Expected end products of results:

Expected products will include:

1. A pamphlet outlining the application of the procedures of functional analysis of behavior to cross-cultural research.
2. An interview instrument capable of producing measures of environmental factors based on learning theory. The instrument should have diagnostic value in identifying relative strengths and weaknesses of environments in the degree to which they provide support for school-related learning.
3. A study of the relationship between environmental characteristics and child performance in traditional and experimental educational programs.
4. A study of the relationship between patterns of environmental characteristics and ethnic group ability patterns.

Expected end products of results (continued)	5. A descriptive comparison of teaching-learning styles and contingency systems in the natural environments of different ethnic groups.
Resources:	A graduate assistant with skills in factor analysis and multivariate statistics, research assistants for secretarial help, and data processing.

A-HG

Title: The Effects of Program Implementation on the Natural Environment

Principal staff: Ronald Henderson, Ralph Wetzel

Purpose, objective, or goals: The objective of this project is to measure the effects of the implementation of an innovative instructional program on characteristics of the home environments of children enrolled in the program.

Importance, need, or justification: It has been demonstrated that variables in the home environment are significantly related to both concurrent and predicted measures of academic achievement (Dave, 1968; Wolf, 1964; Henderson, 1966, 1969). Nationally there is great concern for getting parents more involved in the education of their own children, and in giving them a greater voice in the determination of educational policy which affects their own children. In the Follow-Through Program this concern is reflected in the guidelines which require provisions for parent involvement. The Tucson Early Education Model for Follow-Through includes procedures designed to bring parents into greater participation in the school program and to help them to acquire a greater understanding of the objectives of the instructional program, and, consequently, of the kinds of activities in the home which support school appropriate behaviors and facilitate growth toward these objectives. Since so much emphasis has been placed on parent involvement by funding agencies, it is imperative that the effects of this involvement be evaluated. This could be done from a number of points of view. Insofar as the relationship between home variables and school performance has been well established, it would be important to determine if the implementation of the TEEM program, with its accompanying procedures for involving parents, results in desirable changes in those variables which are known to predict academic success. This project is designed to determine what effects, if any, occur in home environments as a result of the parent program.

Method, strategy, or design:

A comparative design will be used in this project. Baseline and year-end data on home environment variables will be collected, using parent interviews, for an experimental group of families consisting of parents of children in Follow-Through classes, and a comparison group of comparable families of children in traditional programs. In addition, Follow-Through families equated on baseline environmental measures will be rated on the degree of their involvement in theparent program, and highly involved parents will be compared with little involved parents on the amount of change in home characteristics during the interim between baseline and year-end measures.

Characteristics of the users and samples:

Target samples will consist of those families included in the samples for Project A-HF, The Effects of Home Environment on Academic Achievement.

Ultimate users of the products of this project would include educational personnel designing parent education and parent involvement programs and researchers interested in the assessment of effects of intervention programs.

Evaluation procedures:

Environmental data will be collected using a revised form of the interview schedule for the measurement of environmental process variables (see Project A-HF). Data for parents of children in the experimental and comparison samples will be analyzed using a one way analysis of variance design, with the year-end environmental data serving as the criterion measure. (The baseline data will be used to confirm equivalence of the experimental and control groups). The same type of design will be used to analyze data for highly involved and little involved parents of Follow-Through children.

Expected end products of results:

1. Assuming that the revised instrument for the measurement of environments is capable of discriminating change, the instrument itself will constitute a useful product.

Expected end products of results (Continued)	2. A research report on the effects of program implementation on characteristics of target families.
Resources:	Shared with Project A-HF.

Title:	Individual Characteristics and the Development of Behavior
Principal staff:	Sadie Mallory, Wayne Carroll
Purpose, objective, or goals:	To identify skills which vary between individuals and which contribute to successful academic performance. To develop techniques for measuring these skills and for examining the variables with which they are a function. Three broad skill areas have been defined for the initial work. These skills are believed to be important to many aspects of the Tucson Early Education Model. They are not independent of each other. They are: Problem solving behavior, memory skills, and language.
Importance, need, or justification:	It is tantamount to the Tucson Early Education Model that those intellectual skills which underlie academic achievement be identified and formally taught. It is important to include these behaviors in the curriculum. Heretofore, these behaviors have been regarded to be characteristics of the individual and to determine his success in school. It is a fundamental philosophy of the Tucson Early Education Model that these so-called individual characteristics are functions of the environment and can be taught. It is essential if we are to develop educational programs which will be successful with a large group of individuals that such basic intellectual skills be teachable. Children of these studies will be the same children for whom the Tucson Early Education Model was developed: Elementary Mexican-American first, second, and third grade children.
Method, strategy, or design:	Initially, three behavioral areas will be explored. The overlap between these behaviors will then be defined. For example, one can hardly talk about problem solving behavior or memory behavior without talking about linguistic skills. Future work will not only explore the interactions of these fundamental processes in complex skill but will explore other skill areas as well. For example, learning to

Method, strategy, or design (continued)	learn skills, planning, and organizing. Initially, the studies will be done in a laboratory setting but the second year work will introduce analogs to these same studies in the classroom.
Evaluation procedures:	The laboratory work will be guided by the research associates. In the second year, we hope that the classroom teachers will take an active role in the translating of the basic data into classroom procedures which can be systematically researched. We hope to have some data to present to the teachers by September, 1970.
Expected end products of results:	Research papers and data will, of course, be one major end product of this work but we also hope that the techniques for measurement and study of these behaviors will be such that they lend themselves to the development of problem solving behavior, memory skills, and language should also be an end product.
Time schedule:	As mentioned above, the first year should produce some research data on the three basic individual characteristics: Problem solving behavior, memory, and language skills. The second year should see the translation of these procedures into classroom relevant techniques and the broadening of the skill base toward learning to learn, planning, and organizing skills.
Resources:	The National Laboratory will support one principle investigator and two research assistants and a part-time secretary. It will also support the data processing and the supplies. Follow-Through Project will provide two staff members as research associates and the Department of Psychology will maintain Dr. Carroll's salary.

Title: Seriation and Ordination and the Effects on Search Behavior

Principal staff: Sadie Mallory

Purpose, objective, or goals: Piaget has maintained that training specific to inducing operational responses has little or no effect on acquisition of such responses. Rather, cognitive operations emerge gradually through the child's transactions with the "total" environment. On the other hand, advocates of early intervention programs maintain that the environment can be so structured that improvement in intellectual skills is a consequence.

There may be an intellectual skill which is perhaps primary to cognitive operations that is facilitated by training on tasks conceived to embody mental operations of Piaget. This skill is information searching behavior or systematic gathering of environmental data such that problem solving is facilitated. Piaget discusses the ability to anticipate in order to display operational classification and seriation. Anticipation requires retention of information and projecting to a non-included-stimulus its proper relation to some order or projecting constancy to some invariant dimension of a transformation. Conceivably, anticipation requires internal mediational mechanisms which permit the systematic and selective gathering of data such as evinced in certain problem solving tasks. This study is designed to test the influence of training to seriate and to classify on systematic search measured by three information search tasks. The interjected training will include inducement of procedures designed to facilitate solving seriation and classification problems. It is the skill of data gathering which is expected to improve. Thus, this research is directed toward assessing the influence of training in two of Piaget's cognitive operations on an intellective skill which is exogenous to Piaget's theory.

For an intervention project such as The Tucson Early Education Program in which intellectual

Purpose, objective, or goals (continued)

processes as opposed to products are stressed, it would seem important to determine the impact of teaching for thinking processes. This current study would hopefully offer some limited information on this relationship.

1. To evaluate the influence of training to seriate and to classify on systematic information searching behavior.
2. To determine the indirect influence of peer modeling on the acquisition of systematic information searching behavior.

Importance, need, or justification:

Several studies, reviewed by Mermelstein and Meyer (1968), have demonstrated success in inducing conservation operations. Those operations which have been influenced by training have been conservation of weight, substance, and number. In general when training procedures have been effective, middle class children most often with high IQ's have been the subjects. On the other hand, Wohlwill (1960) was unsuccessful in inducing conservation of number. Mermelstein and Shulman (1967) found that schooling had no effect on conservation of substance by comparing children who had formal schooling with Prince Edward County, Virginia, children who did not have formal schooling.

These studies have been equivocal as to the feasibility of inducing certain operations. The results imply the pertinence of considering a different approach to evaluating the effect of training in operational thinking.

Method, strategy, or design:

The three groups will be initially equated on vocabulary. DE, IE and C will be administered two search tasks prior to training and subsequent to training these groups will be administered three search tasks two of which will be identical to the premeasures.

The training will occur for approximately 20 to 25 minutes on each of 12 consecutive school days. The first six days of instruction will be devoted to

Method, strategy, or design (Continued)

seriation learning; the last six days will be classification learning. All children will be taught by the same teacher who will use activities and materials designated by the experimenter. Thus, for each of the three small groups constituting DE, the training will be formally identical. On completing training of the last group on a given day, the materials will be placed in an "interest center" for free manipulation by the children. A given set of materials will be removed from the center on the morning of the third day. Hopefully, the training activities will be piloted prior to use by the teacher.

Characteristics of the users and samples:

Comprising the sample will be 45 second grade children divided into three groups of 15 each. The Ss will be predominantly Mexican-Americans who attend a school servicing a low income population.

One group of 15, the direct exposure group (DE), will be divided into three groups of five each. A second group of 15, the indirect exposure group (IE), will be in proximal contact with the trained group. The third group of 15 Ss will have no contact with the trained children; they will comprise the control group (C).

Evaluation procedures:

A 3 x 2 x 2 repeated on two factors ANOVA design will be used to assess the effect of training.

It may be of interest to obtain a seriation and classification assessment at the terminal performance to correlate with scores on the post tasks.

Expected end products of results:

The results of this applied field research are expected to show significant gains for DE and IE and no significant change for C. The ordering of the means are expected to be: DE IE C.

These results should be meaningful for those concerned about early intervention using a Piagetian base.

Resources:

A cooperating teacher, an examiner to administer the pre and post tasks, production and collection of needed training materials, and statistical analysis and secretarial assistance.

A-IB

Title: Hierarchial Analysis of Visual Memory

Principal staff: John Bergan, Barry Zimmerman supported by Follow-Through funds

Purpose, objective, or goals: A continuing problem in education is that of relating research to practice. The present study is an attempt to increase the coordination between experimentation and teaching by exploring the effectiveness of research-teaching procedure which might be used either by a researcher or a teacher for the purposes of increasing the quality of student performance and generating knowledge about influences on learning. In the present project, the procedure would be applied to the analysis of visual memory ability.

Importance, need, or justification: The project is part of a series of studies designed to investigate human abilities and their relationship to school performance. The research-teaching procedure to be used in the study is derived from the application of task analysis procedures used in system theory in training and industry and more recently in the analysis of learning problems by Gagne (1964) and others (Resnick, 1967).

The validation of hierarchies in the Gagne manner is an arduous task and is best applied to the development of curriculum materials. Such materials are beginning to emerge. In addition, a less formal more flexible procedure for determining hierarchies for individual children is needed. The research-teaching procedure is designed to provide the needed flexibility.

Many teachers probably use methods analogous to the research-teaching procedure. These informal efforts, however, do not have the character of research because the procedures they involve are not applied systematically and typically there are no adequate records of child behavior.

Method, strategy, or design: The research-teaching procedure begins with the specification of a desired terminal behavior or behaviors for the student. The assumption is initially made that with some practice the student will be able to accomplish the terminal behavior without the assistance of a task analysis. If his performance reveals that he cannot achieve the designated criterion level, the following question is posed: What must a child know or be able to do to achieve the terminal behavior? To answer this question, the teacher-experimenter specifies hypothesized component behaviors. An attempt is made to teach the child these behaviors. If the attempt is successful, the teacher-experimenter tests the child at the level of the terminal behavior. If the attempt is unsuccessful, the component behaviors are analyzed into subcomponents. This cycle is repeated until the student achieves criterion mastery or until the level at which the student fails consistently is determined.

Characteristics of the users and samples: Approximately 60 third-grade students selected from Tucson Public Schools would participate.

Evaluation procedures: The McNemar test for the significance of changes (Siegel, 1956) would be used to assess whether or not hypothesized component behaviors influence visual memory.

Expected end products of results: It is anticipated that research findings from the study would be published in a professional journal and would be disseminated as a National Laboratory publication. Further, the research teaching procedure would be presented to teachers for use in the Follow-Through Implementation.

Resources: The National Laboratory provides part-time secretary, research associate, data processing and supplies. Principle investigators are supported by Follow-Through Project.

Title:	Studies of Language
Principal staff:	Wayne Carroll, Theodore Rosenthal
Purpose, objective, or goals:	A series of studies will explore the issue of whether arbitrary rules with which the child could not be familiar can be transmitted by means of models. In the acquisition of rules, shaping procedures (Skinner, 1963) will also be required. The relative contributions of modeling alone, shaping alone, and a combination of the two procedures will be investigated. In addition, the studies will attempt to show that the modeling of complex sentences and the administration of various types of instructions can appreciably affect the child's production of sentences.
Importance, need, or justification:	Numerous studies have demonstrated the deficiencies of culturally disadvantaged children in the area of language development. Since it is a truism that one cannot learn the language of the particular culture without exposure to samples of that language, the role of imitative processes in language learning appears to be of crucial importance. If one does not arbitrarily restrict the scope of the concept imitation to simple mimicry of the model's words, it is possible to demonstrate that culturally disadvantaged children can learn to imitate abstract features of a model's language productions. A recent study (Carroll, Rosenthal, and Brysh, 1969) demonstrated that Mexican-American third grade children will imitate the tense and sentence structure of a model's utterances without specific instructions to do so. The relatively low correlation of word imitation and imitation of tense and sentence structure suggested that the children were inferring the rule governing the model's productions and applying it to their own utterances. Since modeling of lanugage is a fundamental process in the Tucson Early Education Model, data which defined which characteristics of the model's linguistic behavior are transferred through modeling is of utmost importance.

Method, strategy, or design:	The research will be carried on in the laboratory trailer adjacent to this school. It is a laboratory study using three groups: modeling, shaping, and a combination of the two procedures.
Characteristics of the users and samples:	Mexican-American second and third grade children at Ochoa School.
Evaluation procedures:	The analysis of variance.
Expected end products of results:	Research data which will form the basis for the development of curriculum processes.
Time schedule:	Lab modeling studies, 1970; curriculum adaptation, 1971.
Resources:	Research assistant to serve as model, recording instruments and equipment presently installed in the laboratory trailer.

Title: The Development and Evaluation of Educational Change Agent Roles

Principal staff: Carol Rubow supported by Follow-Through funds

Purpose, objective, or goals: Intrinsic to the Tucson Early Education Program is the idea that educational programs and the means by which that program is disseminated cannot be separated. A program can only be as successful as the techniques for disseminating the program are successful. In a sense, the Tucson Early Education Program is currently being disseminated into the field through Follow-Through Project. We hope to use this opportunity to study the processes of dissemination. At present, two principle change agents are involved in this dissemination process. These are, the field representatives who serve as the liaisons between the Arizona Early Education Center and the community and a community based change agent, the program assistant, who serves as a liaison between the field representative and the classroom teacher.

During the first year we hope to develop organized and systematically evaluated training programs for these two important change agent groups. During the second year we hope to examine systematically the roles of the parents of the Tucson Early Education Model. This can be done in depth and on a longitudinal basis with three population groups. The first as previously mentioned is the Ochoa parents who are largely Mexican-American. The second group are the children (birth to five years of age) of University students living in the large married student housing center where there are fine facilities for preschool work. All those connected officially with the University are eligible for the preschool and kindergarten class. The third population group is located within the Model Cities area and comprises Mexican-American, Negro, Indian, and Anglo. A child development center is being set up within the new Community Medicine Complex. These three populations offer unusual opportunities for parent work; in addition, curriculum and research in the infant and young child will be investigated.

Importance, need, or justification:

As stated in the preceding section, program dissemination techniques are considered to be an intrinsic part of the Tucson Early Education Model. With the commitment of this center to Follow-Through Project an opportunity presents itself for the detailed development and analysis of a training program. The parent work plan for the second year indicates the recognition within the Tucson Early Education Model that parents are a necessary and effective component of the educational environment. The field representatives working within the Tucson Early Education Model Follow-Through Program are one target population for this study. These field representatives are in essence the trainers of teacher trainers. The program assistants are in essence trainers of teachers and aides in local school systems and serve as the model teacher for their school staff. Ultimately the parents of children served by the Tucson Early Education Model will form a third target group.

Method, strategy, or design:

The first step in the development of training programs will be the collection of descriptive data on the organization, implementation, and assessment procedures within the existing training programs. In-service training materials will be prepared in in-service work shop formats designed for Follow-Through Project. Responsibilities of each of the change agent groups and their roles will be established. Basic training input shall be developed for all programs. Organization and implementation of training content may vary from community to community based on the level of staff understanding and program needs.

Evaluation procedures:

Since implementation procedures must be congruent with the desires of the population served, community representatives (e. g., parents, Follow-Through directors, and school personnel) will be involved in the development of procedures. Pre-post measures on assessment instruments will form the core of the initial evaluation. These instruments will sample changes in the following areas:

1. attitude toward poverty, children, and intervention;

Evaluation procedures (Continued)

2. knowledge of the Tucson Early Education Model;
3. knowledge of reinforcement techniques.

In addition, some of the instruments developed by the Arizona Center for interaction analysis will be used to sample pre and post training behaviors of both field representatives and program assistants.

Expected end products of results:

Data from the assessment instruments indicating the degree of change in attitude, knowledge of programs, and reinforcement techniques as a function of training. In addition, we envision several training manuals which will include the following topics: training skills, training techniques, and the assessment of training.

Time schedule:

Pre-measures will be collected in the fall of 1969 on both field representatives and program assistants. Work on the training program will continue through 1969-1970 with post-measures on these two groups to be collected in the summer of 1970. Work on the manuals will continue through the remainder of 1970 and into 1971 with the expectation of production by June, 1971. Work with parents will not begin until 1971.

Resources:

During the first year the National Laboratory will support a research assistant, secretarial work, data analysis, and some instrument production costs. Follow-Through will support the principal personnel. In the second year, we are asking for additional funds to develop the parent involvement programs and to expand the training staff for materials development and production.

A-JA

Title: The Training for Field Representatives

Principal staff: Ronald Henderson

Purpose, objective, or goals:

1. To increase operational understanding of TEEM.
2. To increase skill of articulating TEEM using a variety of training techniques.
3. To increase skills of organizing, implementing and assessing training of TEEM personnel working within local school systems.
4. To increase ability to assess and change one's own communication and interaction with TEEM staff in the field.
5. To increase skills of modifying and reinforcing behavior of TEEM personnel in the field.
6. To increase knowledge of relevant research findings as they may relate to the implementation of TEEM and to gain skills in communicating and applying these findings to local classroom operation.
7. To gain skills in organizing, assessing, and reporting relevant field training experiences which may feed back into the development of more generalized effective training techniques by TEEM training staff.
8. To develop attitudes necessary to the effective modeling of the TEEM model.

Importance, need, or justification: Field representatives are the principal liaisons between the Center and the communities using the Tucson Early Education Model. The field representatives within the TEEM Follow-Through Program will become the target population for this study. These field representatives have been hired to train trinees, known as program assistants, in the field.

Method, strategy, or design: The initial training program shall be designed to collect descriptive data on organization, implementation, and assessment procedures within the training program. Evaluation instruments shall be developed to measure attitude, knowledge and operational performance in the field in order to collect pre-post data on training effect. Content for the evaluation instrument shall be based on the training program's

Method, strategy, or design (Continued)

objectives. Three half day meetings will be held each month with field representatives. These meetings shall be focused on the training input for this population. Although basic objectives for this training program will have already been developed, this training population shall be responsible for the development of content and organization for their own population. The main criteria used to assess the validity of training program content and/or organization shall be its appropriateness as applied to their major work responsibility within the model (i. e., the training of program assistants in the field). This training operation, therefore, shall be based on the "modeling technique" a basic operational premise within the TEEM model.

Characteristics of the users and samples:

This population is heterogeneous in that experienced and inexperienced field representatives will be within this training population (a table containing the following information may be developed: age, education, education within TEEM program, year of teaching experience, level of teaching experience).

Evaluation procedures:

Pre-post measures of:

1. Attitudes
2. Knowledge of the Tucson Early Education Model
3. Interaction Analysis
4. Reinforcement Techniques

Expected end products of results:

Data assessment

Manuals:

1. Skills of training
2. Techniques of training
3. Assessment of training

Resources:

Assessment instruments; cooperation of demonstration classroom staff and laboratory staff to provide input concerning current developments in the areas of research and curriculum development as they relate to implementation of TEEM in the field; professional library and laboratory audio-visual holdings; secretarial staff.

A-JB

Title: Training for Program Assistants

Principal staff: Ronald Henderson

Purpose, objective, or goals:

1. To increase operational understanding of TEEM.
2. To increase skills of articulating TEEM, using a variety of training techniques.
3. To increase skills of organizing, implementing and assessing training of teachers and teacher aides within the local school systems.
4. To increase ability to assess and change one's own communication and interaction with staff members.
5. To increase skills of modifying and reinforcing behavior of staff members.
6. To increase knowledge of relevant research findings as they relate to the implementation of TEEM and to gain skills in communicating and applying these findings to local classroom operation.
7. To develop attitudes which are necessary to the effective modeling of TEEM to their staff.
8. To develop attitudes of their respective staffs which are necessary to the effective modeling of TEEM.

Importance, need, or justification: Training of the program assistants is necessary to the effective dissemination of the TEEM Program in the field. This training activity is also basic to the attempts to apply and assess the effectiveness of research findings in the field.

Method, strategy, or design: Training program shall initially be designed to collect descriptive data on organization, implementation, and assessment procedures within the training program. Evaluation instruments shall be developed to measure gains over time in attitude, knowledge, and operational performance in the field in order to collect pre-post data on training effect. In-service training for this population shall be conducted one week a month for eight months on the location of each Follow-Through Program. The field representatives will be responsible for the development of organization and implementation of this

Method, strategy, or design (Continued)

training program. Basic training input shall be developed for all programs. Organization and implementation of training content may vary from community to community, based on level of staff understandings and program needs. Development of training shall fit into the following training design:

Research → Demonstration Classroom → Training

↓

Field Representative Training Model

↓

Program Assistant Training Model

↓

Teacher Training Model

↓

Teacher Aide Training Model

Characteristics of the users and samples:

The program assistants within the TEEM Follow-Through Program will become the target population for this study. Program Assistants are hired within the local Follow-Through Programs to train teachers and aides within the local school systems and to serve as model teacher for their school staff. This population is heterogeneous in that represented within this population is a range of educational background and educational experience.

Evaluation procedures:

Pre-post measures of:

1. Attitude
2. Knowledge
3. Interaction Analysis
4. Reinforcement Techniques

Expected end products of results:

Assessment data

Manual:

1. Skills of training
2. Techniques of training
3. Assessment of training

Resources:

Same as A-JA plus the field travel expenses provided by Project Follow-Through.

Title: Evaluation Techniques and Supporting Technology

Principal staff: Maure Hurt, Sadie Mallory, Shitala Mishra

Purpose, objective, or goals:

1. To identify and develop measures of those behaviors known collectively in the Tucson Early Education Model as intellectual skills.
2. To examine variables in the testing process which may affect the measures of cognitive skill.

Importance, need, or justification:

Since the Tucson Early Education Model proposes to introduce new curriculum and new outcomes, it becomes imperative to develop techniques for measuring the program's effects. The Tucson Early Education Program was originally designed to develop the cognitive skills of Mexican-American children, and there has been a continual effort at this Center to develop appropriate measures. In addition to the development of tests per se, however, we are becoming increasingly aware that there are factors in the examining situation which also may determine the subject's responses on standardized measures. Thus, we feel that the study of these factors should parallel the development of any instruments. The subjects of this program will be children at Ochoa School as well as selected populations among the Follow-Through communities.

Method, strategy, or design:

The program contains two interweaving thrusts. First is the development of particular assessment instruments during the first year. This thrust will measure cognitive skills, e.g., classifying, knowledge of functional uses, and knowledge of cause and effect relationships. During the second year, we will broaden this to other behaviors in the intellectual skill category and the behaviors in the area known as the motivational base. The second thrust is to examine other factors not intrinsic to the test itself which may determine the subject's performance. The data from this second thrust should eventually influence both the construction of assessment instruments and the development of procedures for further administration.

Expected end products of results: Assessment instruments, data on administration techniques, data on the interaction between ethnic variables and psychoeducational appraisal.

Time schedule: During 1970 a test of cognitive skills will be developed and its standardization will be continued in 1971. Studies of additional variables affecting measurement outcome will be developed in 1970 with their incorporation into testing procedures and technique in 1971.

Resources: Testers, the mobile laboratory, testing materials, data analysis.

A-KA

Title: The Development of a Pictorial Test of Cognitive Skills

Principal staff: Barry Zimmerman supported by Follow-Through funds.

Purpose, objective, or goals: The purpose of this project will be to develop a test of four separate cognitive skills: labeling, classifying, knowledge of functional uses, and knowledge of cause-effect relationships. The test will provide the teacher with information which will be directly relevant to classroom practices.

Importance, need, or justification: Previous research at the Arizona Center has found the Van Alstyne Picture Vocabulary Test to be a valid and reliable instrument to use with disadvantaged children (Karabinus and Hurt, in press). The proposed instrument will similarly employ a pictorial format similar to that of the Van Alstyne, but it will assess specific cognitive skills instead. These cognitive skills have been emphasized in the Tucson Early Education Model (Hughes, Henderson, Wetzel, 1968) and an instrument to assess their implementation is needed. In the past, measures of intellectual ability have been used primarily for the purpose of prediction. Recently there has been a growing interest in teaching abilities. Accompanying this interest has been a concern for providing definitions for and measures of specific cognitive skills.

Method, strategy, or design: The instrument will be evaluated cross-sectionally to see whether it yields significantly higher means on the basis of age and experience in Follow-Through It will be factor analyzed to determine whether the *a priori* skill definitions are substantiated by the data. Should orthogonal factors emerge substantiating the existence of separate skills, they will be factor correlated with the Wide Range Achievement Test to see their relevance to academic achievement.

Characteristics of the users and samples: The instrument will be given to approximately 500 disadvantaged children participating in the Tucson Early Education Model Follow-Through Program in grades kindergarten through second.

Evaluation procedures: Principle Components Factor Analytic Procedures employing a Varmimax rotation will be employed (Veldman, 1967) to test the factor structure of the instrument. Analysis of Variance procedures will be used to study the effect of age, program experience, and sex on scores.

Expected end products of results: The instrument is the major end-product of this project having the aforementioned characteristics. It is anticipated that the instrument will be incorporated into the TEEM Follow-Through test battery. In addition, it is expected that the research will result in a publication in a professional journal.

Resources: Data analysis from National Laboratory funds, and Follow-Through funds for staff.

A-KB

Title: The Effect of Mode of Presentation on Two Piagetian Tasks

Principal staff: Sadie Mallory

Purpose, objective, or goals: To determine the effect of total manipulation, partial manipulation, no manipulation on the discontinuous quantity and some to all classification performance of first grade children.

Importance, need, or justification: Piaget has constructed a cognitive theory on the results of children's performance assessed by the methode clinique. The method does not prescribe the locus of manipulation of the materials; thus, in some instances the task materials are manipulated by the subject (S). It is conceivable that the degree of S manipulation of materials influences the level of performance and thereby affects whether S is a conserver or nonconserver on a particular task.

Children who have been administered tasks established on Piaget's procedures have been found to differ in level of performance when the task stimuli was changed. The results are conflicting; however, the assessments were of differing cognitive skills so no direct comparison is possible. These studies do indicate the need to consider the influence of mode of presentation on performance.

Wohlwill (1968), using lower class kindergarten children, evaluated class inclusion under pictorial and verbal conditions. He employed a pre and posttest, counterbalanced design, finding for one experiment that the verbal condition significantly facilitated performance for both testing sessions. There were no significant gains between the pre and posttests. The researcher noted that in no instance did S obtain a higher score in the pictorial condition than in the verbal condition. In a second experiment, using lower class children, four trials of which trials two and three were training sessions were given to the Ss. Ss obtained statistically equivalent means on trial one for both verbal and pictorial conditions. On trial four, there was a significant difference in performance favoring the verbal condition.

Importance, need, or justification:

Transitivity problems were presented under concrete and verbal conditions by Glick and Wapner (1968) to 8, 10, 12, 14, 16, and 18 year olds. More problems were solved in the concrete condition than the verbal condition.

These data clearly indicate that operations defined by Piaget are influenced by mode of task presentation. This influence requires further study under conditions that attempt to control the verbalizations and the concreteness of materials.

The concern of this study appears to have relevance for ACECE program at two junctures. One, it is circumscribed by Piaget's theory which is one of the theoretical positions influencing program development. Two, this study would provide indirect evidence for the effect of instructional procedures which incorporate student manipulation of objects. The curriculum which ACECE fosters stresses learning via pupil manipulation more than via teacher demonstration.

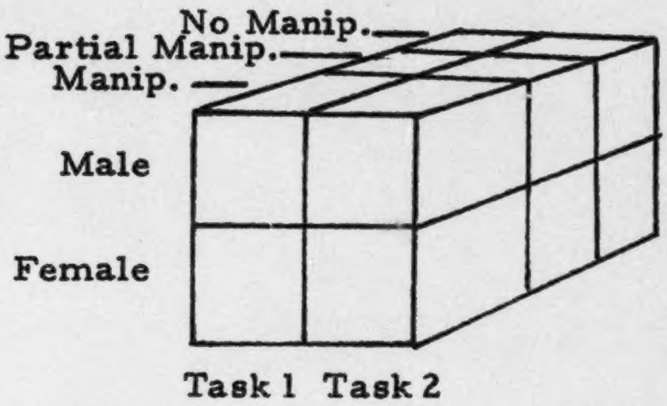
Method, strategy, or design:

This is an experimental study using laboratory-like procedures in the field. Mode of task presentation will be manipulated using instructions that are formally similar for each of three conditions. There will be two tasks each including three levels of presentation. The tasks and levels will be counterbalanced such that no S will receive the same order of mode of presentation for the two tasks.

Characteristics of the users and samples:

A sample of 30 first grade children divided equally between the sexes will be used. These children will attend a school servicing a low income population (preferably Ochoa) and will be predominantly Mexican-American.

Evaluation procedures: A 2 x 2 x 3 repeated on two factors ANOVA.


No Manip.
Partial Manip.
Manip.
Male
Female
Task 1
Task 2

Expected end products of results: It is expected that the results will support the efficacy of student manipulation on performance. This prediction is based on the assumption that mental operations are derived from physical operations on the stimuli.

Resources: Materials, examiners, and Research School.

A-KC

Title: Ethnic Variable and Psychoeducational Appraisal

Principal staff: Shitala Mishra, testers

Purpose, objective, or goals: The present study proposes to answer some questions concerning what is generally called examiner effect on test performance. More specifically, the objectives of the study are as follows:

1. To investigate whether the race of examiner interacts with the race of the subject.
2. To find out what type of subject's responses, i.e., verbal, nonverbal or performance, are susceptible to examiner's ethnic background.

Importance, need, or justification: For many years, research in the area of testing was dominated by the Galtonian view which regarded the test as a sample of the subjects' responses to a standardized nonpersonal stimulus. This view still persists to some extent in modern testing. However, with growing sophistication in the area of testing, the traditional view is becoming increasingly untenable. Psychometrists are becoming aware of the examiner as a factor in determining the subject's responses on standardized tests.

Since the examiner in a testing situation is an interacting member of a dyadic relationship, it is important to take into consideration certain examiner variables, i.e., his sex, training, race, etc., which might act as possible correlates of examinee performance. We cannot afford to leave several cues which are transmitted from examiner to subject at a preconscious level. This direction of inquiry has led some researchers to stress the sociopsychological nature of the psychological evaluation. The focus of the attention of the proposed study, therefore, will be to investigate the effect of tester ethnicity on test performance.

Serious questions are raised concerning the testing of children of minority races by white examiners. Many believe this could result in underestimating the

Importance, need, or justification (Continued)

performance of such children. One anonymous author (Pedagogical Seminary, 1916, p. 202) states that "mere presence in the room of a member of the dominant race creates an atmosphere in which it is impossible to get a normal response." Evaluation of the program for the education of disadvantaged, therefore, could present serious problems when testing is done by testers of different ethnic backgrounds, differing from the ethnicity of the children. It is important, therefore, to find out whether typical low performance of disadvantaged children on standardized tests may be the result of their being tested by testers of the dominant race.

There is some evidence in the literature indicating that the race of the examiner effects the performance of the subjects. Candy (1936), for example, noted that there was an average increase of six points in the I.Q. of Negro children tested by Negro examiners, and an average decrease of six points for Anglo children tested by Negro examiners. LaCrosse (1964) also reported that white examiners obtained lower S-B scores on retest when testing Negro subjects who have been previously examined by Negro examiners. The same white testers also obtained significantly higher retest scores with white subjects previously tested by white examiners. Forrester and Claus (1966) studied kindergarten subjects and noted that Negro Ss achieved lower I.Q. on S-B when the test was given by female Negro testers than when they were examined by female white examiners. Summers and Hammonds (1965) have also reported similar results.

Method, strategy, or design:

Subjects in each group will be tested using WISC and RPM individually by three groups of examiners with three different ethnic backgrounds. The subjects will be randomly assigned to each tester within the group. The order of the testing will be counterbalanced in order to control for the effect of order of test presentation. The testing will be done according to standard directions provided in the manual.

Characteristics of the users and samples: The subjects for this study will be selected from the grade five population of local elementary schools. Total number of subjects selected for this study will be 270 of which 90 will be Anglo, 90 Mexican-American, and 90 Negro. These three groups of subjects will be matched initially on some intellectual measure.

Evaluation procedures: An analysis of variance (AOV) design will be used to compare the responses obtained by three groups of testers. The AOV will be followed by a series of post-hoc comparisons using Tuckey's A.

Expected end products of results: Data on the effects of ethnicity of examiner's performance.

Resources: Fifteen testers and examination materials which are the Wechsler Intelligence Scale for Children and the Raven's Progressive Matrices Test.

CHICAGO EARLY EDUCATION RESEARCH CENTER

70706-G

Lab. Cate.	Center Code	Program, Project/Activity Title	Principal Investigator
2.1	G-A	Studies in Early Influences Upon Social and Cognitive Responsiveness	Daniel Freedman
2.12	-AA	Twin Children and Their Response Patterns in the Early Years	Daniel Freedman
2.13	-AB	Cross-Cultural Studies of Responses in Newborns and in Children in the Early School Years	Daniel Freedman
2.11	-AC	Identifying and Describing Patterns of Social Interaction, Nursery School Through Grade One	Daniel Freedman
2.1	G-B	Studies of Children's Language and Cognitive Development	
2.11	-BD	Cognitive Processes Underlying Meaning Systems	Carol Feldman
2.12	-BE	Elaborated and Restricted Language Codes Among Bilingual Lower Class Children	Carol Feldman
2.21	-BH	Studies of Perceptual Processes in Children by Modalities and Their Implications for Schooling	Joseph Wepman
2.11	-BI	The Structure of Classification as Revealed in Sorting Behavior	Carol Feldman
2.12	-BJ	Phonological Studies in Early Childhood	D. McNeill
2.1	G-D	Studies in Normal Classroom Behavior	
2.13	-DA	Studies of Constraints and Socialization in the Nursery School	Philip Jackson
2.12	-DB	Children's Transition Behavior and Activity Patterns During Free Play in the Nursery School	Susan Stodolsky
2.2	G-E	Studies of Planned Change and Communication in School Systems	Frederick Lighthall

CHICAGO EARLY EDUCATION RESEARCH CENTER

70706-G

Lab. Cate.	Center Code	Program, Project/Activity Title	Principal Investigator
2.1	G-F	Studies of Achievement Motivation	Robert LeVine
2.13	-FA	Replication Studies in Nigeria of Research on Ethnicity and Achievement	Robert LeVine
2.13	-FB	Child Rearing Values and Occupational Role in Chicago Ethnic Groups	Robert LeVine
2.3	G-G	Research in the Methodology of Longitudinal Studies	David Wiley
2.33	-GA	Studies to Generate Models for Examination of Change in the Structure of Variables Over Time	David Wiley
2.33	-GB	Longitudinal and Cross-Sectional Statistical Models and Task Standardization for Sorting Experiments to Identify Configurational Changes in Children's Development of Concepts	David Wiley

Title: Studies in Early Influences Upon Social and Cognitive Responsiveness

Principal Staff: Daniel Freedman

Purpose, objective, or goals: To identify and distinguish early environmental and hereditary influences upon children's social and cognitive response patterns from the neonatal period through the early school years with particular reference to different developmental sequences attributable to differences between identical and fraternal twins, sex differences, and continuities and discontinuities of the first six years of life.

Importance, need, or justification: With research being taken more and more seriously which reflects the crucial importance of early influences on future growth and development of human potential, the parallel need for a solidly validated data base describing how environmental influences operate emerges strongly as the essential foundation upon which intervention programs can be developed.

Method, strategy, or design: Qualitative and quantitative description of filmed and videotaped data, and protocols based on direct observations of subjects are being analyzed in accordance with various theoretical frameworks. Patterns of social and cognitive responsiveness sustained during segments of the first six years are being identified and interrelationships among them described. Selection of subjects has been made to make possible cross-cultural comparisons also.

Characteristics of the users and sample: Sample: Chinese-American, European-American newborns and random groups of children in the age range four through seven years.

Users: Other research personnel interested in the areas under investigation and in fields related to them; scholars and educators engaged in research-and-development activity such as formulating and pilot-testing of intervention programs for which results of this research would form an appropriate part of the knowledge source.

Expected end products of results:	The descriptive and inferred findings of the research activity in this program continue to be reportable in film records and written accounts. The films will be available for display and teaching purposes, a monograph write-up in preparation on some of the twin material along with journal articles such as one in preparation for Science will be accessible to the scientific and educational communities.
Evaluation procedures:	Both process and product evaluation in their application to basic research investigations are utilized in the appropriate phases of Program A as the pervasive, conventional requirements of such studies demand.
Relationship to other center projects and center focus:	The results of Program A research are being watched carefully by EERC investigators, especially those in Program B, for implications they give promise of carrying for studies of children's language and cognitive development at later stages. In addition, all EERC personnel are alert to the possibilities of generating new research on the basis of questions raised during the course of Program A activity.
Flow chart, time schedule:	The progress of research in Program A is reflected in the flow of projected report documents: Winter, 1969--journal article on selected cross-ethnic findings. Summer, 1969--summary article on findings in twin studies. Fall, 1969--preliminary report on social development study findings.
Linkages of activities within the program:	The development of analytical concepts in one activity which have relevance in the data handling for other activities is a frequent occurrence. Linkages among activities in this program through shared results of significance and common utilization of data are also pervasive as in the case of the twin and cross-cultural studies. Joint use of Piagetian tasks in several phases of the program activities represent a linkage point involving collaborative contacts.

G-AA

Title: Twin Children and Their Response Patterns in the Early Years

Principal Staff: D. Freedman, R. Marvin

Purpose, objective, or goals: To assess the role of heredity in the early social responsiveness of infants.

Importance, need, or justification: Results of the determination of hereditary significance in early responsiveness will contribute to the restructuring of the theoretical framework within which child development may be considered.

Method, strategy, or design: Classic identical-versus-fraternal twin comparison method to determine genetic differences will be employed with data gathering for twins and singletons structured through the use of the Brazelton-Freedman scales for newborns.

Characteristics of the users and sample: Sample: Newborn twins at County Hospital, Chicago; Japanese-American and European-American babies.

Users: Scholars in the general scientific community.

Expected end products of results: Increased understanding of the hereditary role reported through motion picture film; a monograph projected for winter, 1970, in collaboration with Brazelton and utilizing data generated by both Chicago and Boston research centers; book chapter, "The Importance of Behavior Genetics and Ethology" to be published in Behavior Disorders of Children, edited by Herbert Rie, scheduled for release by the Aldine Press, Chicago, in 1970; shorter written statements; periodical pieces and interim summaries of progress.

Evaluation procedures: Standard evaluation techniques in the basic research tradition are utilized throughout this continuing project.

Resources: Trained observers and data analyzers, computer facilities, cooperating hospitals.

G-AB

Title: Cross-Cultural Studies of Responses in Newborns and in Children in the Early School Years

Principal Staff: D. Freedman, N. Freedman, and M. Edelman

Purpose, objective, or goals: To differentiate learned and hereditary aspects of temperament among ethnic differences.

Importance, need, or justification: The demonstration of the unity embracing biology and culture will contribute to elaborations of theoretical frameworks within which to consider various aspects of child development.

Method, strategy, or design: Cross-ethnic comparisons of newborns through naturalistic observational data collection modes including major reliance on the newly developed Brazelton-Freedman Newborn Behavioral and Neurological Assessment Scale.

Characteristics of the users and sample: Sample: Newborn singletons at nurseries in Chicago, San Francisco, Hawaii, and Colorado.

Users: Ethological theorists and child developmental specialists.

Expected end products of results: Book chapter entitled "Temperament" will be included in a beginning psychology textbook edited by Brendan Maher to be published by Wiley during the summer of 1970.

Evaluation procedures: Standard Evaluation techniques in the basic research tradition utilized in this project are part of the design.

Resources: Subjects in a variety of settings, e.g., Ute Indians to be studied in 1970 in collaboration with Sidney Margolin of the Department of Psychiatry at the University of Colorado Medical School in Denver.

G-AC

Title:	Identifying and Describing Patterns of Social Interaction, Nursery School Through Grade One
Principal Staff:	D. Freedman, D. Omark
Purpose, objective, or goals:	To study the development of interpersonal hierarchicization in children between the ages of three and seven years with initial emphasis on sex differences.
Importance, need, or justification:	This is one of the first applications of ethological ideas to child development and offers promise of spawning a distinctive stream of research from this potentially richly promising perspective.
Method, strategy, or design:	The basic methodology of this study is classic sociometry with data collection by means of video-taped records facilitating analysis.
Characteristics of the users and sample:	Sample: Nursery and grade school children in the age range three through seven years contacted in the settings of local school situations. Users: Educators, psychologists, and ethological professionals.
Expected end products of results:	A demonstration film showing boy-girl differences will be completed by the first quarter of this fiscal period. Two dissertations and articles derivative from them will be completed by summer, 1970: "The Development of Early Social Interaction," and "An Evolutionary Approach to the Development of Dominance Hierarchies."
Evaluation procedures:	Standard evaluation techniques in the basic research tradition utilized in this project are part of the design.
Resources:	Video-taping and motion picture equipment, computer facilities, Laboratory school settings, research assistant data analyzers.

Title: Studies of Children's Language and Cognitive Development

Principal Staff: Carol Feldman, G. David McNeill, and Joseph Wepman

Purpose, objective, or goals: To define and to assess variables in language and cognitive development with emphasis on the four to eight year old age range; to determine relationships among these variables between them and other aspects of children's functioning, and between them and children's social backgrounds; to study processes by which change in children's language and cognition may be brought about; to make information on these topics more readily available to persons immediately concerned with carrying out preschool educational programs.

Importance, need, or justification: The value of adequate conceptualizations of language and cognition in planning and assessing early education experience is particularly notable at the present time when general notions of what human language and thinking involve are changing so rapidly. The special importance of this program lies in the way in which it can relate such notions to children's actual behavior, and can demonstrate the way in which each child's functioning forms an interrelated network within him, varies from one child to another, and is modifiable by programs of intervention.

Method, strategy, or design: The strategy of ProgramG-B consists in designing small-scale studies which together further the purposes identified above. The following methodological considerations apply variously to each investigation: (a) formulation of theoretical justification of a language or cognition aspect of evident relevance; (b) determination of measurement procedures for that aspect often requiring original design; (c) tracing of age change in the aspect and establishing its relation to relevant developmental or background variables; and (d) exploring the mechanisms of change in the aspect. One or another of these components may be emphasized in a single activity, and for each, the most relevant experimental or correlational study is set out.

Characteristics of the users and sample:	Sample: Predominant among the variety of samples represented in this program are preschool and early grade children within the "normal" range on most parameters. In two cases, however, disadvantaged and lower-class bilingual children are included in the sample groups. Users: In addition to other knowledge producers, users of Program G-B products include professional operations personnel in educational enterprises engaged in program development or modification for young children.
Expected end products of results:	The results of Program G-B studies will be made public in speeches, papers, journal articles, or books, as seems best to achieve the broadest possible communication with the segments of the user population most deeply concerned with the end products as they emerge from the research activity.
Evaluation procedures:	Test-retest procedures provide evaluative data in some activities in this program as in the case of the study of maternal influences on cognition. In this example as elsewhere, evaluation is treated as the usual component of standard research procedures.
Relationship to other center projects and center focus:	The results of Program G-B activities stimulate new research in other programs (and vice versa) by raising basic questions. At several points a mutuality of interest between investigators has resulted in collaboration, once, for instance, in exploration of joint use of a data pool, and again in the cooperative formulation of a research problem now constituting a discrete activity.
Flow chart, time schedule:	The specific studies presently constituting Program G-B will be completed or nearly completed by the end of the 1969 budget year. Others will be begun within the context of program purposes, often building on previous program work, as time, manpower, and subjects become available.

Linkages of activities within the program:	Program G-B activities all clearly relate to language development, cognitive development, or to the interrelationship of the two and to this extent each is linked to all others. More specifically and illustratively, joint efforts among several program personnel on both methodological and substantive dimensions are underway through a new research thrust on language intervention.

G-BD

Title:	Cognitive Processes Underlying Meaning Systems
Principal Staff:	C. Feldman, S. Plafker
Purpose, objective, or goals:	To study the emergence of meaning systems in young children; to study the way in which the five to eight-year-old child processes language meaning; to relate these processes to later functioning.
Importance, need, or justification:	Fuller understanding of what children hear when they are spoken to and what meanings are conveyed in various modes of such communication may have significance in developing instructional programs for informational and other purposes.
Method, strategy, or design:	Stimulus sentences, factual and opinion, provide the basis of subjects' responses under both tape-recorded and natural conversation conditions.
Characteristics of the users and sample:	Sample: Five, eight, and eleven year old children of racially and ethnically diverse middle class backgrounds. Users: Scholars and program developers interested in the nature of communication and teaching communication arts to young children.
Expected end products of results:	Articles, speeches and contributions to book-length works constitute the tangible products of this project; they reflect the increased understandings which are the major outcomes.
Evaluation procedures:	Evaluation is an essential, intrinsic part of the research design.
Resources:	Subjects, experimenters, recording equipment.

G-BE

Title:	Elaborated and Restricted Language Codes Among Bilingual Lower Class Children
Principal Staff:	C. Feldman
Purpose, objective, or goals:	To study some effects of bilingualism and monolingualism on cognitive development, particularly in the lower class child who, according to Bernstein, has only the restricted language code in the languages that he speaks.
Importance, need, or justification:	Teachers are well aware of the weaknesses of the bilingual child, his vocabulary difficulties, etc. Cognitive strengths in such children can also be identified here; educational programs could direct themselves to those strengths. In addition, if it can be shown that a lower class bilingual child functions as though he had two language codes (in the sense that Bernstein's middle class child has), this may provide some hint as to how to get a lever on the difficulties of the lower class child.
Method, strategy, or design:	Children are assigned such tasks as the following: object constancy, relabeling of an object with another common noun, relabeling of an object with a nonsense syllable, object relations, and object relations with label changes. Object identification involved both pointing and verbal responding.
Characteristics of the users and sample:	Sample: Lower class monolingual and bilingual children, controlled for residence neighborhood and enrollment in Head Start programs. Users: Theorists pursuing the implications of Bernstein's work, educators serving bilingual children, educational theorists and program developers focusing on work with the lower class child.
Expected end products of results:	The customary conference and journal presentations will serve to disseminate the findings of this study to other researchers and educators.
Evaluation procedures:	Evaluation procedures are built into the experimental design.
Resources:	Experimental subjects, research assistants, stimulus materials.

G-BF

Title:	The Structure of Classification as Revealed in Sorting Behavior
Principal staff:	C. Feldman, J. Salvador
Purpose, objective, or goals:	To understand the way in which children classify both new (nonsense) and familiar objects in their environments; the way in which this changes with age; the purpose such sorting serves for children and how this changes with age; what differences can be identified in children's classification of three-dimensional objects versus two-dimensional representations.
Importance, need, or justification:	The results of children's performance on free sorting tasks reveals category structures in the mind, that is, the way in which children cognicize.
Characteristics of the users and sample:	Sample: Three, five, and eight-year old children. Users: Other researchers; teachers and others who work with children.
Method, strategy, or design:	The basic method of this study is experimental. Children will be asked to put things together that go together. Variants on this procedure will indicate the reasons for their choices.
Evaluation procedures:	Data analysis will be facilitated by computer programs under development by EERC associate David Wiley whose analytic modes will provide qualitative as well as quantitative descriptions of the data generated in the various free sorting procedures.
Expected end products of results:	Increased understanding as suggested in Objectives and reflected in research reports and speeches.
Resources needed:	Computer families, research assistants, photographic capabilities, stimulus materials.

G-BH

Title:	Studies of Perceptual Processes in Children by Modalities and their Implications for Schooling
Principal Staff:	J. Wepman, W. Hass, A. Morency, B. Lozar, and S. McCormick
Purpose, objective, or goals:	To study the development of perceptual processes by modalities; to relate such perceptual processes to conceptual learning (school achievement); to isolate perceptual modality strengths and weaknesses prior to or at the onset of formal schooling; to plan curricular patterns in keeping with the perceptual modality predilection when it appears.
Importance, need, or justification:	The value of adequate conceptualizations of language and cognition in planning and assessing early education experience is particularly notable at the present time when general notions of what human language and thinking involve are changing to rapidly. The special importance of this project lies in the way in which it can relate such notions to children's actual behavior, and can demonstrate the way in which each child's functioning forms an interrelated network within him, varies from one child to another, and is modifiable by programs of intervention.
Method, strategy, or design:	The strategy of the study area consists in designing small-scale and longitudinal studies which together further the purposes identified above. The following methodological considerations apply variously to each investigation: (a) formulation of theoretical justification of a pre-linguistic language or cognition aspect of evident relevance; (b) determination of measurement procedures for that aspect often requiring original design; (c) tracing of age change in the aspect and establishing its relation to relevant developmental or background variables; and (d) exploring the mechanisms of change in the aspect. One or another of these components may be emphasized in a single activity, and for each, the most relevant experimental, correlational or longitudinal study is set out.

Characteristics of the users and sample:	Sample: Predominant among the variety of samples represented in this program are preschool and early grade children within the "normal" range on most parameters. In some cases, however, disadvantaged and lower-class bilingual children are included in the sample groups. Users: In addition to other knowledge producers, products include professional operations personnel in educational enterprises engaged in program development or modification for young children.
Expected end products of results:	The results of the areas studied will be made public in speeches, papers, journal articles, books and teacher workshops and seminars, as seems best to achieve the broadest possible communication with the segments of the user population most deeply concerned with the end products as they emerge from the research activity.
Evaluation procedures:	Test-retest procedures provide evaluative data in some activities in this program as in the case of the study of maternal influences on cognition and the development of standardized tests. Evaluation is treated as the usual component of standard research procedures.
Resources:	Laboratory school setting for testing and pilot tryout of materials developed, testers, data analyzers, curriculum planners and developers.

Title:	The Structure of Classification as Revealed in Sorting Behavior
Principal Staff:	C. Feldman, J. Salvador
Purpose, objective, or goals:	To understand the way in which children classify both new (nonsense) and familiar objects in their environments; the way in which this changes with age; the purpose such sorting serves for children and how this changes with age; what differences can be identified in children's classification of three-dimensional objects vs. two-dimensional representations.
Importance, need, or justification:	The results of children's performance on free sorting tasks reveals category structures in the mind, that is, the way in which children cognicize.
Method, strategy, or design:	The basic method of this study is experimental. Children will be asked to put things together that go together. Variants on this procedure will indicate the reasons for their choices.
Characteristics of the users and sample:	Sample: Three, five, and eight-year-old children. Users: Other researchers; teachers and others who work with children.
Expected end products of results:	Increased understanding as suggested in Objectives (above) and reflected in research reports and speeches.
Evaluation procedures:	Data analysis will be facilitated by computer programs under development by EERC associate David Wiley whose analytic modes will provide qualitative as well as quantitative descriptions of the data generated in the various free sorting procedures.
Resources:	Computer facilities, research assistants, photographic capabilities, stimulus materials.

G-BJ

Title: Phonological Studies in Early Childhood

Principal staff: D. McNeill

G-D

Title:	Studies in Normal Classroom Behavior
Principal Staff:	Philip Jackson, Susan Stodolsky
Purpose, objective, or goals:	To describe the ways in which children accommodate to situational factors in their early school experiences, to relate the patterns of reactivity that emerge with such factors as age, sex, and type of school environment, and thus to provide the basis for the eventual development of intervention procedures designed to facilitate the goals of classroom instruction in the light of the research findings.
Importance, need, or justification:	A notable gap in research on teaching and learning is reflected in the paucity of validated knowledge about what actually happens to children in classrooms. Even the most basic observational studies in this realm have not been undertaken with any thoroughness. Results of studies in this program should begin to close that gap and will provide the basis upon which tested instructional alternatives for teachers may rest.
Method, strategy, or design:	Observational systems constitute the major methodological procedure in this program. Patterns and frequencies of selected behaviors by children in school settings and play situations are being revealed in the statistical analysis of the data derived from the observations. Cross-cultural validation is involved in one activity.
Characteristics of the users and sample:	*Sample*: Nursery school and primary grade children in middle class and mixed lower/middle groupings constitute the subject samples. *Users*: Other research workers for whom results of these studies are relevant. Eventually those involved in operational school settings will find results of these studies useful.
Expected end products of results:	Some of the initial work in the observational/descriptive phases of Program G-D research will be reported in a forth-coming issue of the *Journal of Educational*

Psychology. The study segment on constraints encountered by nursery school students is in the final stages of data analysis which will be reported and planned for release in Spring, 1969. Following next summer, end products will be prepared in the research stream exploring children's transitional behavior in free play settings in school situations.

Evaluation procedures:	This process is infused in the various stages of the research procedures in Program G-D.
Relationship to other center projects and center focus:	Program G-G is particularly closely related to activities in this set of studies primarily through the collaborative work undertaken by Professors Jackson and Wiley in the conceptualization and data analyzing stages of the Nursery School project.
Flow chart, time schedule:	Not applicable in the present evolutionary stages of work within this program.
Linkages of activities within the program:	The major connections between activities with Program G-D are described in the common purposes and methodologies which they share.

G-DA

Title:	Studies of Constraints and Socialization in the Nursery School
Principal Staff:	P. Jackson
Purpose, objective, or goals:	To increase understanding of children's accommodations to the variety constraints and social interaction demands found in nursery school settings; to complete cross-cultural validation of earlier observational work in this area; to relate findings to program development in the University of Chicago Nursery School.
Importance, need, or justification:	Results from this study will permit better informed intervention in nursery school programs toward the goal of reducing the incidence of constraining and frustrating experiences against the background of a taxonomy of their types.
Method, strategy, or design:	Naturalistic observation constitutes the basic methodology of the study; cross-cultural comparison is involved in one aspect of the investigation.
Characteristics of the users and sample:	Sample: Four and five-year-old nursery school students in cross-sectional and longitudinal cohorts. Users: In addition to other researchers, school people will be able to make use of the findings of this research in program development activities.
Expected end products of results:	Scholarly papers reporting research results will be read at professional meetings and published in learned journals.
Evaluation procedures:	Standard research procedures include appropriate evaluation techniques.
Resources:	The nursery school setting, observers and coders, computer facilities including provision of programming expertise.

G-DB

Title: Children's Transition Behavior and Activity Patterns During Free Play in the Nursery School

Principal Staff: Susan Stodolsky, A. Karlson

Purpose, objective, or goals: To enhance our understanding of the free play behavior of nursery school children through observational procedures which measure both transition behavior and aptterns of activities during free play.

To attempt demonstration, more definitively than has been done before, of a relationship between individual children's behavior in free play and changes on a variety of standard test batteries.

Importance, need, or justification: Studies conducted during 1968-69 on transition behavior of children have demonstrated that such behavior is clearly developmental in nature. No relationship between patterns of transition and change in standardized test performance has been suggested. Preliminary analysis of data on activity which were of less central concern in 1968-69 suggest the possibility that such relationships might exist if more adequate data on activity patterns were available. In addition, many current evaluation studies (for reviews, see Weikert, 1969; Hodges and Spicker, 1968) point to the necessity for clearer definitions of the educational treatment variables in order to interpret educational outcome measures meaningfully. Taken together, our own work and that of other preschool educators strongly support the proposition that behavioral observation of chaildren in the nursery school will provide a useful intersection for evaluation and developmental work.

Method, strategy, or design: A longitudinal study of children in nursery schools using observational and standardized testing procedures.

Characteristics of the users and sample: Sample: Nursery school children of varying sex and social class in the age range from approximately 3-6 years.

Users: Other research workers and evaluators in the short range; program developers eventually.

Expected end products of results:	A coding system which will allow description of activity patterns; research reports in articles and speeches.
Evaluation procedures:	Standard statistical procedures.
Resources:	Computer facilities, trained observers and testers, cooperation of nursery schools.

Title: Studies of Planned Change and Communication in School Systems

Principal Staff: Frederick Lighthall

Purpose, objective, or goals: To describe, develop, and pilot test a new role, that os social psychological specialist, to facilitate planned change and communication in school systems.

Importance, need, or justification: The inclusion of the social-psychological role among other professional roles within schools will contribute significantly to the effective review, adaptation, and incorporation of innovations in schools.

Method, strategy, or design: Two trainee specialists in the new role have been placed in school systems and, by performing various functions of the role, are providing data that will be the basis of further modification and development of the role. Specifically, the trainees are providing data on such processes as entry, interpersonal conflict, membership (inclusion-exclusion) cross-role communication, territoriality, crisis management and interpersonal influence. Analysis of taped records of interventions in an elementary school system will provide a source of data upon which refinements in the training procedures for the specialists will be based.

Characteristics of the users and sample: Sample: The trainees and school systems in which they are working have been selected in accordance with the established procedures for decision-making about student/interns and cooperating schools within the Graduate School of Education.

Users: In addition to the generation of research data of use to other investigators, this program will provide guidance to trainers of professional personnel generally and within school systems particularly.

Expected end products of results: An end product of Program G-E will be the development of the new role in school systems, and, therefore, an increased capacity for cooperative innovation in these systems. Intermediate products will include a transcription of an audio-tape of a problem-sensing

	meeting that will provide basic data on some typical kinds of hidden problems that arise in planned change situations. In addition, the accumulated experiences of the role incumbents in the two training positions, including the communications problems to which they have addressed themselves, will be the focus of summer writing in 1969.
Evaluation procedures:	Customary evaluation procedures consonant with established research methodology are utilized throughout the study.
Relationship to other center projects and center focus:	The primary relationship between this program and others in the Center proceeds through potential applicability of its findings to the dissemination and installation in school systems of developed products from the other programs.
Flow chart, time schedule:	Inapplicable at this pilot research stage.
Linkages of activities within the program:	This is a single Project program.

Title:	Studies of Achievement Motivation
Principal Staff:	Robert LeVine
Purpose, objective, or goals:	The purpose of this program has been to improve understanding of the environmental conditions, particularly those connected with the socio-economic participation and values of parents, that produce in children achievement motivation or other dispositions related to cognitive adaptation.
Importance, need, or justification:	This program's importance derives from the fact that that adaptation through cognitive performance is becoming increasingly central for rural migrants to the city in this country and throughout the world.
Method, strategy, or design:	The basic research strategy is a comparative one--the cross-cultural analysis of ethnic variations in achievement motivation and their educational and social consequences.
Characteristics of the users and sample:	Sample: The subject samples include a variety of ethnic groups in Chicago (Lithuanians, Cubans, Poles, and Armenians) as well as foreign groups (Yucatec Maya peasants, Cree Indians, and Hausa Nigerians). Users: Researchers and developers of educational programs, particularly those working with cultural groups other than the dominant one in the given society.
Expected end products of results:	Products of this program take the form of research papers and other publications. Examples are the Langman dissertation "Economy, Motives, and Values: An Exploration into Causal Relationships," and the LeVine chapter "Cross-Cultural Study in Child Psychology" (in Carmichael's Manual of Child Psychology, edited by P. Mussen).
Evaluation procedures:	This process is embedded in the research procedures utilized throughout the projects in this program.

Relationship to other center projects and center focus:	A fundamental aim in this research is to make the cross-group comparison at home and abroad afford the entire Center an opportunity for replication of studies linking environment and performance. Thus, initial concentration has been on ethnic variations in parental environments before encompassing performance measures of children.
Flow chart, time schedule:	During the present contract period it is anticipated that the initial phase of data collection at the newly established research outpost in northern Nigeria will be completed. The analysis of these data and their relationship to other aspects of the program, going forward and due for completion during the same time period in Chicago, will determine specifics in future time schedule projections.
Linkages of activities within the program:	Included in Relationship section above.

G-FA

Title:	Replication Studies in Nigeria of Research on Ethnicity and Achievement
Principal Staff:	R. LeVine, S. LeVine, R. Fahrmeier
Purpose, objective, or goals:	To follow up and in part replicate earlier work on ethnic variations in childhood experiences, their realtionships to achievement motivation and their educational consequences; to develop improved methods for cross-cultural studies.
Importance, need, or justification:	To provide the basis for more effective educational programs through dissemination of findings on the impact of motivational techniques in early childhood, cross-culturally derived.
Method, strategy, or design:	Cross-cultural methods directed initially toward the acquisition of authority patterns among selected northern Nigerian children. A major emphasis will be on the comparison of children who go to school and those who do not (within the Nigerian context the opportunity is provided to obtain sizeable control groups of normal and intelligent children who never go to school).
Characteristics of the users and sample:	Sample: Native Nigerian children of the Hausa culture within the context of their family groups. Users: Educational developers and other research personnel.
Expected end products of results:	Scholarly reports and publications.
Evaluation procedures:	Among standard evaluation procedures, batteries of cognitive tests will be developed and administered to preschool and school-age children and adults, in rural and urban settings, and focusing on a range of aspects of cognitive process including color-form perception, concept formation, verbalization and memory, within a sample drawn from populations varying along a rural-urban continuum, in occupation status (peasant farmer vs. pastoral nomads vs. literate bureaucrats and traders) and most importantly, in school-going.

Resources: Contrasting cultural settings, personnel and equipment adequate to the conduct of psychoanalytically focused enthnographic and clinical studies, large-scale surveys of parents' attitudes and personality characteristics, large-scale psychological testing of children and adults, particularly on cognitive variables, and longitudinal studies of children and their parents.

G-FB

Title:	Child Rearing Values and Occupational Role in Chicago Ethnic Groups
Principal Staff:	R. LeVine
Purpose, objective, or goals:	To provide supportive background materials for the studies underway at the Nigerian research center (Project G-FA above); and to investigate cultural variations among selected ethnic groups in Chicago in childrearing values as related to occupation roles of parents.
Importance, need, or justification:	The effect of early parental influence on children's later performance on intelligence tests and in school appears to be crucial determinant. Investigation of this relationship promises important findings for intervention activities in early childhood education programs.
Method, strategy, or design:	The basic research methodology in the studies comprising this project is cross-cultural comparative.
Characteristics of the users and sample:	Sample: School-age children and their parents in selected ethnic communities in Chicago who will be observed, interviewed, and tested in surroundings familiar to them. Users: Results of this research will be useful to scholars in anthropological fields and related disciplines, and will eventually have implications for educational program planners.
Expected end products of results:	Several research reports suitable for publication will be generated by this research.
Evaluation procedures:	Within accepted research conventions, evaluation plays an integral part in this study.
Resources:	Subject populations, research assistants for interviewing and testing, programmers and computer facilities for analytical aspects of data processing.

G-G

Title: Research in the Methodology of Longitudinal Studies

Principal Staff: David Wiley

Purpose, objective, or goals: To develop new methodological procedures for longitudinal research investigations of young children, and specifically to develop new mathematical models for dealing with longitudinal data and to create some statistical tools for a particular study of the child's development of conceptual categories.

Importance, need, or justification: Most of the methods now used for the analysis of data in this research area are extremely primitive. New ones are required for the acceleration of the systematic advancement of knowledge.

Method, strategy, or design: Much of the work in this problem area is mathematical and statistical and requires the development of computer programs with illustrative analyses of existing data. Some of it, however, will require the collection of new data and the application to it of new methodological techniques.

Characteristics of the users and sample: Sample: Preschool and primary grade children constitute the sample population in those phases of research in this program which relate to the generation of new data.

Users: Users of the techniques developed will be research workers in the appropriate substantive fields.

Expected end products of results: The speech and papers listed in the flow chart section below are the now-known end products of the research in Program G-G. As additional results become known, corresponding reports will be planned and executed in accordance with the user audiences most likely to benefit.

Evaluation procedures: The models being developed will be evaluated by confirmation of their utility or fit with real data.

Relationship to other center projects and center focus:	The concept development aspects of this program are related to several activities in Program G-B and collaborative efforts are underway between two groups of investigators concerned, spear-headed by Professors Wiley and Hass. In addition Program G-D personnel, including Professor Jackson, have shared responsibilities within the Nursery School project with Professor Wiley and his associates. More generally, the development of new methodological tools is relevant to all of the centers within the National Laboratory as well as to the field at large.
Flow chart, time schedule:	During the present contract period, the following major vehicles of dissemination have been projected constituting a flow chart of progress points in the research activities: February, 1969 - AERA paper on concept development in children over time. April, 1969 - Psychometric Society paper. November, 1969 - Draft of formal paper on longitudinal models.
Linkages of activities within the program:	The development of statistical tools in the longitudinal study of concept development makes direct contributions to the model development in the other major program activity.

G-GA

Title:	Studies to Generate Models for Examination of Change in the Structure of Variables Over Time
Principal Staff:	Wiley
Purpose, objective, or goals:	To develop new methodological procedures for longitudinal research investigations of young children, and specifically to develop new mathematical models for dealing with lingitudinal data. In particular, to extend the single variable analysis program, developed in earlier stages of this research, to a programmed statistical model which will permit analysis of longitudinal data in its full generality.
Importance, need, or justification:	Most of the methods now used for the analysis of data in this research area are extremely primitive. New ones are requires for the acceleration of the systematic advancement of knowledge.
Method, strategy, or design:	Much of the work in this problem area is mathematical and statistical and requires the development of computer programs with illustrative analyses of existing data. Some of it, however, will require the collection of new data and the application to it of new methodological techniques.
Characteristics of the users and sample:	Sample: Existing data pools from the literature: physical growth and development data and psychological growth and development data; longitudinal study data when sufficient in published form or when access can be gained to original raw data, and large longitudinal data banks such as that preserved at the Fels Institute or now being collected by other investigators who have not yet reached publication stages intheir research but who would be willing to share data. Users: Other researchers, particularly those in the National Laboratory, conducting studies for which the emerging methodology will be useful.

Expected end products of results:	As results emerge from this stream of research, speeches and published papers will be planned and executed in accordance with the user audiences most likely to benefit. Working papers and interim progress reports will continue to facilitate dialogue within the National Laboratory at various stages on the way to check points of completion in the research.
Evaluation procedures:	The models being developed will be evaluated by confirmation of their utility of fit with real data.
Resources:	Computer facilities, sources of longitudinal data already collected, eventually settings in which appropriate longitudinal data can be originally collected.

G-GB

Title: Longitudinal and Cross-Sectional Statistical Models and Task Standardization for Sorting Experiments to Identify Configurational Changes in Children's Development of Concepts

Principal Staff: D. Wiley

Purpose, objective, or goals: To create some statistical tools for a particular study of the child's development of conceptual categories. To engage in a long-range scientific communication enterprise. More specifically, to communicate with scholars in the context of these three thrusts:

(a) using the methodology for curriculum evaluation
(b) using the methodology for developmental structures in linguistics and concept generation
(c) refining and extending the methodology itself.

Importance, need, or justification: Most of the methods now used for the analysis of data in this research area are extremely primitive. New ones are required for the acceleration of the systematic advancement of knowledge.

Method, strategy, or design: Much of the work in this problem area is mathematical and statistical and requires the development of computer programs with illustrative analyses of existing data. Some of it, however, will require the collection of new data and the application to it of new methodological techniques.

Characteristics of the users and sample: Sample: Preschool and primary grade children across the entire range of background factors constitute the sample populations.

Users: Research workers in the appropriate substantive fields.

Expected end products of results: As results emerge from this stream of research, speeches and published papers will be planned and executed in accordance with the user audiences most likely to benefit. Working papers and interim progress reports will continue to facilitate dialogue within the National Laboratory at various stages on the way to check points of completion in the research.

Evaluation procedures:	The models being developed will be evaluated by confirmation of their utility or fit with real data.
Resources:	Computer facilities, programming expertise, child subjects, opportunities for collaborative associations such as have been established with EERC Professor Feldman who shares interest in research on sorting tasks and who will be making use of the evolving computer programs from this research.

CORNELL RESEARCH PROGRAM IN EARLY CHILDHOOD EDUCATION

70706-C

Lab. Cate.	Center Code	Program, Project/Activity Title	Principal Investigator
1.	C-A	Administration and Support Services	H. N. Ricciuti
2.1	C-B	Curriculum Development and Early School Learning	
2.32	-BB	Facilitating the Development of Syntactic Structures	Marion Potts
2.11	-BC	Early Learning in the Kindergarten	Herbert Ginsburg
2.12	-BD	Analysis of Artistic Behavior in Young Children	W. L. Brittain
2.2	C-C	Analysis and Modification of Home Teaching Environments	
2.21	-CA	Analysis and Modification of Maternal Teaching Strategies in Rural Poor Families	Margaret Parkman-Ray
2.22	-CB	Influence of Systematic Story Reading by Teenagers and Adults on Language Development of Disadvantaged Two-Year-Olds	John S. Harding
2.1	C-D	Cognitive and Emotional Development in Infancy (Birth to 2-1/2 years)	Henry N. Ricciuti
2.12	-DB	Influence of Previous Experience and Stimulation on Emotional/Arousal Characteristics in Infants	Henry N. Ricciuti
2.12	-DC	Inter-Relationships Between Emotional or Arousal Characteristics in Infants and Early Learning	Henry N. Ricciuti
2.21	-DD	Facilitating Infant Development in Selected Functional Areas: Some Pilot Studies and Preliminary Guidelines	Henry N. Ricciuti

C-B

Title: Curriculum Development and Early School Learning

Principal Staff: Marion Potts, Herbert Ginsburg, W. Lambert Brittain, Laurel Hodgden

Purpose, objective, or goals: Broad aims of this program center upon the assessment and analysis of a number of intellectual, learning, and problem solving processes and characteristics in preschool and kindergarten-age children as background for the development of curriculum materials and teaching strategies which can be tailored to meet the assessed needs of individual children in preschool and kindergarten settings.

Importance, need, or justification: To develop effective curriculum materials and programs appropriate for preschool children, much more basic knowledge is needed concerning significant cognitive and learning processes as these diagnostic techniques for assessing the status of individual children, along with closely related curriculum suggestions and guidelines. Systematic experimentation with specific methods for facilitating learning in particular areas, such as the development of syntactic structures, is also very much needed, as are techniques for the measurement of outcomes of such training procedures.

Method, strategy, or design: Details of method and design are described in the accompanying project summaries for each of the following projects, which constitute this program for the 69-70 year:

1. Facilitating the development of syntactic structures: an experimental study of several methods of teaching syntactic structures to disadvantaged four-year-old children is just being completed. The next year's work will concentrate on the further development and refinement of a test of language production appropriate for use as an evaluation instrument in language training programs.

Method, strategy, or design (continued)

2. Early Learning in the Kindergarten: This is essentially an ecologically oriented analysis of how children in a "progressive" kindergarten setting begin to learn to print or write and read. The study leans heavily on detailed naturalistic observations in the classroom, supplemented by small experimental studies as necessary.

3. Analysis of Artistic Behavior in Young Children: This project has focused on detailed observations of children's artistic behavior in structured preschool situations, as well as some informal experiments to examine hypotheses derived from these observations.

A fourth project which will be completed by December 1969 has focused on the development of diagnostic procedures for use by teachers in assessing characteristics of preschool children. These procedures are being incorporated in a manual containing curriculum and teaching suggestions appropriate for fostering the development of each of the characteristics under consideration.

Characteristics of the users and sample:

Three-, four-, and five-year-old children, Caucasian and Negro, mostly working class and poor children, both urban and rural; also some children from professional and middle class families; all enrolled in preschool programs of various sorts.

Expected end products of results:

Manual containing diagnostic procedures and teaching guidelines for preschool and kindergarten teachers; curriculum guidelines in regard to language training; preliminary form of a language production test for use as an evaluation instrument with some normative data provided; technical research reports, including one containing educational implications derivable from the study of writing and printing behavior in the kindergarten.

Evaluation procedures: See "Method" section above and project summaries.

Relationship to other center projects and center focus: See Introductory comments concerning efforts to achieve more programmatic organization of Cornell Research Program.

Flow chart, time schedule: See project summaries.

C-BB

Title: Facilitating the Development of Syntactic Structures

Principal staff: Marion Potts

Purpose, objective, or goals:

To meet the critical need for an instrument that can measure language production at the level of syntax. During this year's research on the facilitation of syntactic development, the lack of appropriate language tests became compellingly obvious. In order to have an adequate criterion measure for our 1968-69 study, we found it necessary to begin to develop a test of language production. Our objective for next year is to further develop and refine the preliminary form of this test. Before continuing with further language curriculum studies, we feel it makes sense to develop an adequate evaluation instrument.

Importance, need, or justification:

In spite of the volume of language studies now in progress, the evaluation instruments available are unsatisfactory for several reasons. The best measure of the language development of a child should be an analysis of an adequate sample of his free speech. This method is rarely used. There are still serious problems of reliability in transcribing such samples. Moreover, hundreds of hours are required to do a transformational analysis to produce the grammar.

Other language measures are often used instead. Frequently they deal with vocabulary: a rather superficial level of language control. Berko devised an effective measure at the level of morphology. This is a useful supplement to vacabulary tests; it still falls below the level of syntax. Fraser et al have tried having children repeat sentences as a reflection of syntactic control. Yet the imitation aspect here makes it impossible to know how much command the child actually possesses. At the level of syntax, there exists no satisfactory instruments. Yet because it deals with the rules by which a child builds sentences, syntax is the level which best reflects language development. The current focus on language studies makes it critical that a measure of production be developed.

Method, strategy, or design:

The language production test is administered in a story-completion format. Each incomplete story is presented by the examiner in a form designed to elicit the target syntax. At the last sentence of the story stem, a picture is shown and the child is asked to complete the story. Reliability and validity checks done this year on 60 Ss indicate that the measure has promise. We may be able to get basic information on language development in 30-45 minutes.

We plan first to refine items which have already proved reliable. New items will then be developed to ensure an adequate pool for each area of syntax. Simultaneously, illustrations will be made by a children's artist. As items and illustrations are developed, they will be pretested with Ss in both rural and urban areas near Ithaca. Large-scale testing will include several criterion instruments to be administered to the normative population.

Item analyses will be done to determine which items to maintain for the final test. Complete test analysis will provide: test-retest reliability and measures of internal consistency, predictive and concurrent validity coefficients, and normative data on several age ranges and SES levels.

Characteristics of the users and samples:

We plan to procure a sample of 3-, 4-, and 5-year-olds, approximately 100 Ss of each age. Half of each CA level would come from middle class backgrounds, half from disadvantaged environments. We will attempt to get an urban sample comprised of half black, half white, Ss.

Evaluation procedures:

In order to assess the validity of the test, and its relationship to other measures of language behavior:

1. We will procure tapes of free speech in a standardized situation, for a subsample of our population. Through transformational analysis, a grammar will be written for these Ss. The degree to which the Production Tests results for these children approximates the analysis of their free speech will then be analyzed.

Evaluation procedures (Continued)

2. Bellugi-Klima Comprehension Test of Syntactic Structures will be administered to all Ss. This staff has developed a refined version of Bellugi's original ideas, a version which she feels is particularly useful. We obtained high reliability on it this year. The relationship of the Production Test to the Comprehension Test will be assessed.

3. Several other measures will be used. These may include: several subtests of ITPA, the Fraser et al imitated production procedure, and the Frank and Osser measure of language complexity.

4. An intelligence test will be selected in order to better describe the population, and to look at some of the relationships between aspects of language and "IQ."

Expected end products of results:

We see three major end products stemming from preliminary standardization of such a test:

1. A research instrument which would be a valid and efficient criterion measure for language studies.

2. A diagnostic instrument based on the norms developed from the standardization sample. With the compilation of additional normative data, this would have wide application for preschool programs for both middle class and disadvantaged children.

3. Basic data on the order of emergence of syntactic structures within and across subcultural groups.

Relationship to other center projects and center focus:

The development of the language production test grew out of the collaborative language research on the facilitation of syntax. It was developed by the Cornell staff and forwarded to the Arizona Center for feedback. Due to staffing problems, Arizona was able to give the test to only ten Ss this year. However, Mrs. Arline Hobson of that staff would like to work with

Relationship to other center projects and center focus (Continued)

testing next year. If funds are available, we would be eager for her to give the production test to Southwestern children.

Flow chart, time schedule:

December, 1969-January-February, 1970

Item Development and Refinement
Production of Art Plates
Piloting

March-April-May, 1970

Administration of Production Tests and Criterion Measures

Summer-Fall, 1970

Test Analysis
Item analysis, reliability, validity, weighting

C-BC

Title: Early Learning in the Kindergarten

Principal staff: Herbert Ginsburg, Edward Tulis

Purpose, objective, or goals: The major aim of this research has been to investigate in detail a number of significant intellectual and learning processes in young children as these occur in the context of a kindergarten environment designed to elicit spontaneous, largely self-directed problem solving and learning activities. The project is concerned both with greater theoretical understanding of cognitive and motivational processes involved in classroom learning, and with the design of optimal classroom environments. During the past year, special emphasis has been placed upon the analysis of how children learn to print and write. A great deal of observational data on children's beginning attempts at printing, writing and reading have been collected, and are now under analysis. During the latter part of the present contract year and the early part of the 69-70 year, emphasis will be upon:

a. completion of the observational data analysis;
b. collecting modest amounts of additional observational data or conducting some small experimental studies, if necessary, to clarify, or resolve some issues raised by the analyses of the past year's observations; and
c. writing a report on this work with considerable reference to the broader educational implications which are derivable from the study of writing and printing behavior.

Importance, need, or justification: Little or nothing is known about the acquisition of writing skills in young children, and about many related intellectual activities which take place in the school learning situation. Similarly, there is great need to develop more sophisticated methodologies for analysis of intellectual and learning functions in the "natural" school setting. Increased understanding of these functions should provide a basis for more effective curriculum development and planning.

Method, strategy, or design:	A first and continuing concern has been the construction and maintenance of an interesting "progressive" kindergarten classroom, in a rural public school setting. Writing (printing) was "taught" by giving children notebooks and pens and allowing them to learn to write whenever they please. The aim of this part of the research was to discover what, how, and why children learn to write under such circumstances. The design was primarily observational, and involved two sources of evidence. The notebook productions of each child can be scored so as to determine what is written, whether the printing improves over time, etc. The second source is an observational record of children's writing behavior, yielding information on amount of time spent copying and producing letters, checking the production against a model, sounding the letters at the time they are written, etc. These data provide evidence on what is learned, on the process of learning, and on motivation for learning to write. Some use is made of TV tape recordings of children's behavior.
Characteristics of the users and samples:	Five-year-old rural poor white children in a kindergarten classroom,
Expected end products of results:	Observational and coding procedure for investigating writing and other intellectual and learning activities in the classroom; technical reports, suggestions and guidelines for establishing intellectually stimulating progressive kindergarten environment.
Evaluation procedures:	See "Method" above.
Flow chart, time schedule:	See "Purpose" above.

C-BD

Title: Analysis of Artistic Behavior in Young Children

Principal staff: W. L. Brittain

Purpose, objective, or goals: To gain a greater understanding of the psychological processes involved in the development of various kinds of artistic behavior in young children. Such knowledge should provide a basis for making wiser use of artistic materials and programs in curriculum planning at the preschool and kindergarten levels.

Importance, need, or justification: Although art activities play a large role in nursery schools and Head Start programs, very little is known about the relation of these activities to significant aspects of psychological growth and development in young children. The research underway is seen as providing a basis for a comprehensive theory relating the development of artistic behavior to the child's cognitive, social, and emotional growth, thus facilitating a more effective utilization of art activities in preschool programs.

Method, strategy, or design: During the last couple of years this project has been directed toward observing and developing hypotheses about the role of art at the preschool level. This has been profitable in that there are now several important directions in which this project can move. It seems desirable at this point to pull together the notions about the importance of art for children of this age and also to develop a framework in which to examine links between behavior in other areas and children's artistic productions. Therefore, this next year is planned to complete work on the hypotheses that have evolved from the study of children's art work thus far.

Several directions that seemed promising are listed below. The first three have been worked through in some detail and a report on the progress thus far has been reported. It is also felt that some attention needs to be focused upon curriculum planning during the next year.

Method, strategy, or design (Continued)

One study examined the influence of practice upon drawing squares. This replicated some of the work that had been done in the Cornell Nursery School with a larger sample of children. The evidence from the first sample of 14 children indicated that it is not profitable to attempt training children to draw squares. This may not be as true with four-year-old children as it is with three-year-old children. A larger sample was needed here to give more definite information about the effects of training. An equal number of three- and four-year-old children from diverse nursery schools (N = 52) were given practice in square making. This involved tracing around square forms, making squares from straws, recognizing squares in the environment, copying over squares, etc. The data for this study is presently being analyzed and should be completed in the early fall.

One area that was originally thought to be fruitful for this project was a comparison of the drawings by four-year-olds of objects which have been manipulated with drawings of objects which have been only visually observed. It was postulated that the initial experience for children with objects needs to be manipulative and nonvisual and this method would help determine the amount of tactile or other sensory experiences necessary to provide assessment of objects. Several small studies with kindergarten and nursery school children gives support to these assumptions and this data needs further examination.

During the preliminary observation of children working with art materials, it has been noted that some three-year-old children drew forms spontaneously which they cannot duplicate under directed activity. A triangle may be freely drawn as a representative symbol, as an eye in drawing of a man, but this same child is not able to duplicate a triangle when asked to do so. Further investigation on this phenomenon seems warranted and some raw data has already been gathered for analysis.

Method, strategy, or design (Continued)

Although no clear direction has yet emerged, it is clear that some attention in the next year should be paid to curriculum planning in art. Most nursery schools utilize many so-called art experiences as a basic part of their program. However, there are no guidelines for selecting certain activities over others and the range of possible art experiences seems limitless. It is hoped that some of the findings can be utilized to make a start on the problem of curriculum planning.

Flow chart, time schedule:

Because of limited funds, this project will remain relatively inactive until December 1, 1969. Beginning at that point, no new directions of research will be undertaken, but major emphasis will be placed on completion of the lines of inquiry summarized above, writing up final reports on the work, etc., by late summer of 1970.

Title: Analysis and Modification of Home Teaching Environments

Principal staff: Margaret Parkman-Ray, Helen T. M. Bayer, John Harding

Purpose, objective, or goals:

1. To analyze more precisely the educationally relevant aspects of mother-child interaction in the homes of four-year-old children from isolated, rural poor white families; and to develop home teaching programs aimed at improving mother's effectiveness in facilitating the educational development of their children.

2. To develop and evaluate the effectiveness of home tutoring programs aimed at facilitating language development of two-year-old disadvantaged children through systematic story reading by teenage and adult story readers.

Importance, need, or justification: It is generally recognized that many poor children living in isolated rural areas, and urban poor children from various ethnic minorities enter the public school system at a considerable disadvantage because of restricted previous learning experiences. Increasing opportunities for learning, intellectual, and language development in the home should help to improve learning and achievement in the school situation.

Method, strategy, or design: One study has focused on the analysis of teaching strategies of middle class and rural poor mothers through the use of detailed observations of mother-child in structured situations, and through systematic interviews. The effectiveness of a weekly home teaching program carried on with 12 rural families is to be evaluated by examining changes in maternal teaching strategies as well as changes in intellectual performance of the children.

A second study employs brief daily home visits by teenage or adult visitors who read story books and

Method, strategy, or design (continued)	play language games with two-year-old children in order to stimulate language development and usage. Age and race of story readers, race and sex of children, and length of the reading programs are factors under investigation.
Characteristics of the users and samples:	Mothers and four-year-olds in isolated, rural poor white families, as well as middle class families; also poor city children, both Caucasian and Negro, 18 to 33 months of age.
Expected end products of results:	Teaching materials and procedures appropriate for home use with four-year-olds, coding procedures for analysis of mother-child interaction via TV tape recordings, story reading program appropriate for use with three-year-olds, technical reports, reports for broader dissemination.
Evaluation procedures:	See "Method" section above and project summaries. Story reading program with two-year-olds involves before and after measures of expressive and receptive vocabulary, and average length of utterance.
Relationship to other center projects and center focus:	See introductory comments concerning efforts to achieve more programmatic organization of Cornell Research Program.
Flow chart, time schedule:	See project summaries.

C-CA

Title: Analysis and Modification of Maternal Teaching Strategies in Rural Poor Families

Principal staff: Margaret Parkman-Ray, Helen T. M. Bayer, Barbara Engst

Purpose, objective, or goals:

1. To describe differences in mother-child interaction in middle class and in isolated, rural poor families which may be related to the educational development of the preschool-aged child; and

2. To develop a home teaching program directed toward changes in the mother-child interaction which will increase the probability that the child will succeed in the types of learning experiences characteristic of the school.

Importance, need, or justification: Rural poor children are handicapped in their school adjustment by the impoverishment of the learning experiences available in their home environment. The exact nature of this impoverishment of learning experiences is not known. It is hoped that specification of the differences in teaching strategies of middle class and rural poor mothers will provide a partial definition of the home experiences of rural poor children which handicap their educational development. It is also hoped that enrichment during the preschool period will improve their initial and subsequent school performance.

Method, strategy, or design: During the next two years, utilizing audio and video tapes already collected, we will be analyzing the teaching strategies of middle class and rural poor mothers and determining week by week changes in the teaching strategies of those rural poor mothers who participated in our program.

The teaching strategies with which we are concerned include:

1. Provision of information and use of information to direct the child's attention to details of an object being observed in order to increase the complexity of his understanding of the object.

Method, strategy, or design (Continued)

2. Observing child's behavior and providing him with information as he can utilize it in an on-going activity.
3. Relating the child's present experience to previous experiences.
4. Encouraging the child to ask and answer questions by answering his questions carefully, indicating whether his answers are correct or incorrect, praising correct answers, and providing the correct answer when the child's answer is incorrect.
5. Developing activities which can be utilized to teach the child specific information.

Characteristics of the users and sample:

Our sample consists of the mother and four-year-old in 36 families meeting the following criteria: mother's age is less than or equal to 35 years, number of children is between three and seven; child's birthdate is between December 15, 1963 and December 15, 1964, he has at least one younger sib; the mother is not working fulltime during the day; the family does not own a farm; it is white and intact. Twelve of the families are professional middle class--the comparison sample. These families met the additional criteria: father has completed four or more years of college; mother has completed two or more years of college. Twenty-four of the families are rural poor, meeting the criteria: no parent has more than a twelfth grade education and no more than one parent in any family has this twelfth grade education; stated value of house (if buying) is less than or equal to $12,000; reported income is less than $130 take home weekly. Twelve of the rural poor families participated in our 16 week teaching program--the experimental sample--and the remaining twelve served as the control sample.

Expected end products of results:

Description of teaching strategies of middle class and rural poor mothers. Teaching materials and program assessment materials for a home teaching program.

Evaluation procedures:

We will be analyzing the following data for the comparison, experimental, and control samples:

1. Peabody Picture Vocabulary Test on child
2. Wechsler Adult Intelligence Scale on mother
3. Wechsler Pre-School Intelligence Scale on child
4. Coded observations from videotapes of structured situations
    a. we asked the mother to make a clay pig and to help her child to make one
    b. we asked the mother to read a storybook she has not seen (we developed it) to her child
    c. we asked the mother to take an imaginary trip with her child on a tripboard of a rural countryside, where they can stop and look at anything along the way
5. An interview schedule concerning the child's play activities and mother's social involvements

Flow chart, time schedule:

While it is planned to complete as much of the analyses described above as possible during the next contract year, it is anticipated that some further analyses of importance will remain to be done during the following year. If necessary, funding for the additional analyses will be sought either within the Cornell ECE program, from the National Coordination Center, or from other sources.

C-CB

Title: Influence of Systematic Story Reading by Teenagers and Adults on Language Development of Disadvantaged Two-Year-Olds

Principal staff: John S. Harding, Eleanor D. Macklin

Purpose, objective, or goals: The general goal is to learn as much as possible about the effects of systematic story reading on young disadvantaged children, especially on their language development, with the specific aim of developing story reading "programs" which can be employed to facilitate such language development. The basic general hypothesis is that it is possible to produce a substantial and lasting increase in the pace of language development in these children through a program in which an older individual comes to the child with attractive materials and an encouraging teaching style, beginning when the child is around two years old. Most of the specific questions studied are questions about the relative effectiveness of variations in the basic "action program." A long term concern is inducing mothers to carry on various forms of language encouragement after termination of the formal reading program.

Importance, need, or justification: It is known that retarded language development is characteristic of poor children in the United States, especially poor children from ethnic minorities such as Negroes, Puerto Ricans, Indians, etc. Slow language development places the poor child at a tremendous disadvantage in the American school system, and is one of the principal factors responsible for characteristically inferior school performance. It is also known that systematic stimulation of language development in young children is comparatively rare in lower class homes, in contrast to middle class homes. Thus, facilitation of language development is an obvious goal for an intervention program.

Method, strategy, or design: The research is designed around an action program with some constant features and some variable ones. The constant features include: a one-to-one relationship between child and female story reader who makes

Method, strategy or design (continued)

brief house visits for at least three months; use of simple toys, and conversation to attract the child's interest in early phases of the program, with gradually increasing emphasis on story reading; questioning of child and verbal reinforcement of language responses at all stages of the program. Variable features of the program whose effects are under investigation are:

1. age and race of story reader
2. length of reading program
3. race and sex of children

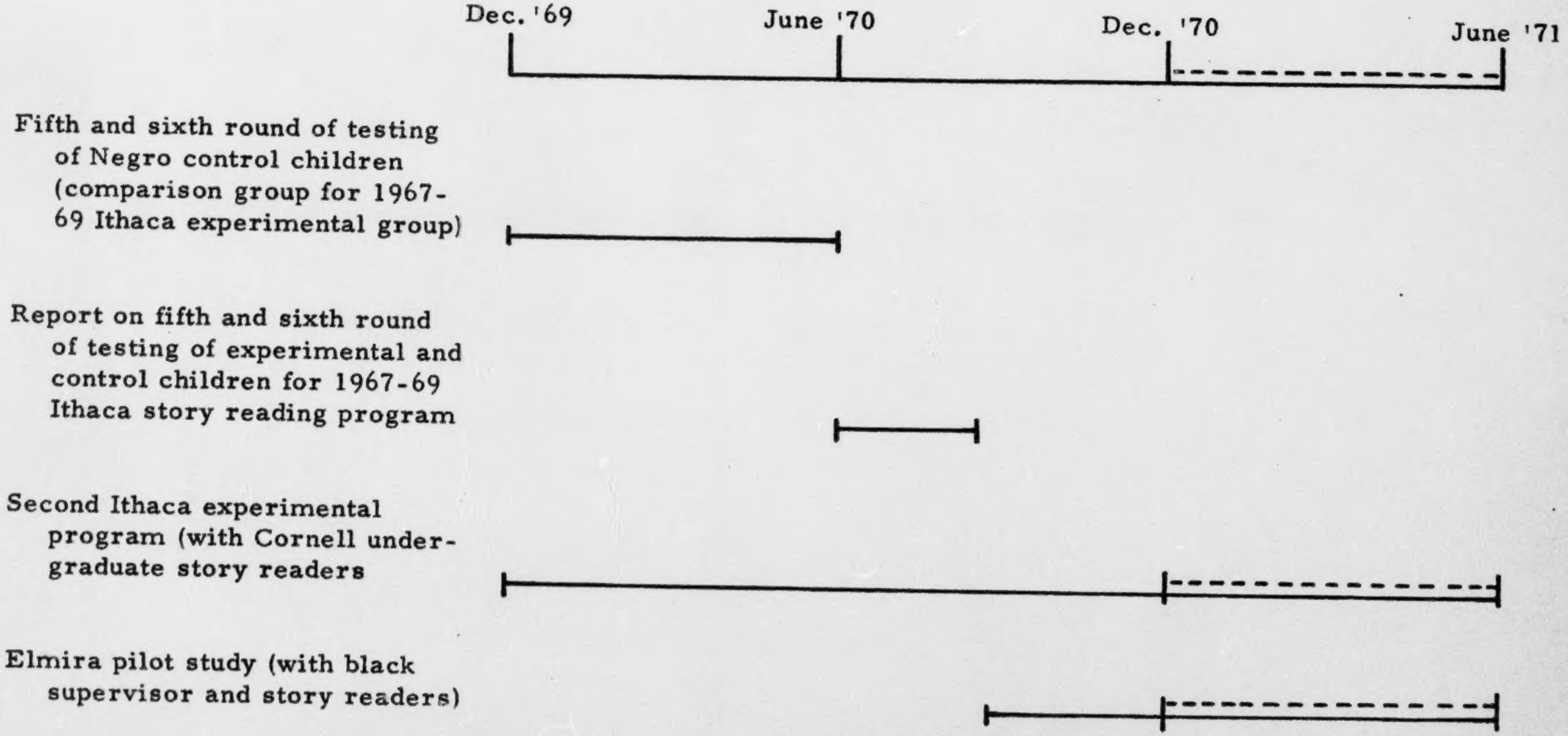
During the 1969-70 program year, we plan to investigate two variations on the action program described in our annual report of June 1, 1969. One variation will be carried out in Ithaca with a new sample of black two-year-olds and story readers drawn entirely from Cornell students enrolled in the undergraduate course on "The Family in Poverty." We expect that each child will be read to twice a week by a student, and we shall try to involve each mother in additional reading to her child as early as possible in the program.

The other variation will be similar to our 1967-68 program except that we expect to work in Elmira, New York with a black field supervisor, black story readers, and black subjects. The main problem with this variation is that if we begin, as planned, in September, 1970, we will be taking on a commitment to an action program lasting until June, 1971--six months beyond the end of the 1969-70 program year. There are several reasons why we feel this does not seriously violate the general principle of not making project plans running beyond December 1, 1970:

1. The principal investigator expects to apply to other federal sources for funding of the story reading research program beginning in December, 1970.

Method, strategy or design (continued)	2. It is possible that at least a portion of the story reading research can be included in the general plan of the Cornell ECE program for the 1970-71 program year. 3. The prospects for funding of the Elmira action program under either of these arrangements should be fairly clear by June, 1970. If no funds are in sight by this time, no attempt will be made to begin the program.
Characteristics of the users and sample:	Poor children in Ithaca and Elmira, ages 18 months to 33 months at beginning of program. Approximately 60 per cent Negro and 40 per cent white.
Expected end products of results:	Research reports; also a "program package" we can recommend to other communities with detailed information about probable cost and probable benefits.
Evaluation procedures:	Systematic before-and-after testing of children in experimental and matched comparison groups; interviews with mothers of experimental and comparison group children and taped speech samples of children in some groups.
Flow chart, time schedule:	Attached.

Project: Influence of Systematic Story Reading by Teenagers and Adults on Language Development of Disadvantaged Two-Year-Olds



C-D

Title: Cognitive and Emotional Development in Infancy (Birth to 2-1/2 years)

Principal staff: Henry N. Ricciuti, Robert Poresky

Purpose, objective, or goals: The major objectives of this program are essentially those previously stated:

1. The development of a conceptual framework and related experimental procedures for more precise assessment of developmental changes in infants' emotional and "approach-withdrawal" responses to a variety of stimulus situations (Area A)

2. An examination of the nature and stability of individual differences in these emotional response patterns, over three-month as well as longer intervals (Area A)

3. An investigation of the relationship between the infant's emotional responses and characteristics of his previous experience and stimulation (Area B)

4. A study of the relationship between emotional or arousal characteristics of the infant and various perceptual-cognitive, learning, and problem-solving behaviors (Area C)

5. Formulation of preliminary guidelines for the development of procedures aimed at fostering optimal development in infants; also initiation of some pilot studies on the facilitation of development in several functional areas through systematic experiential modification (Area D)

Importance, need, or justification: This research program is based on the premise that there is great need for a fuller understanding of emotional and motivational development in the first two to three years of life, particularly with regard to inter-relationships between emotional responses and early learning as well as intellectual and social

Importance, need, or justification (Continued)

development. Such research is needed both to provide us with more complete basic knowledge of this very important period of early development, and to help us develop relevant information and guidelines which will be of value for those concerned with providing environments and experiences aimed at facilitating optimal development in infants and young children.

Flow chart, time schedule:

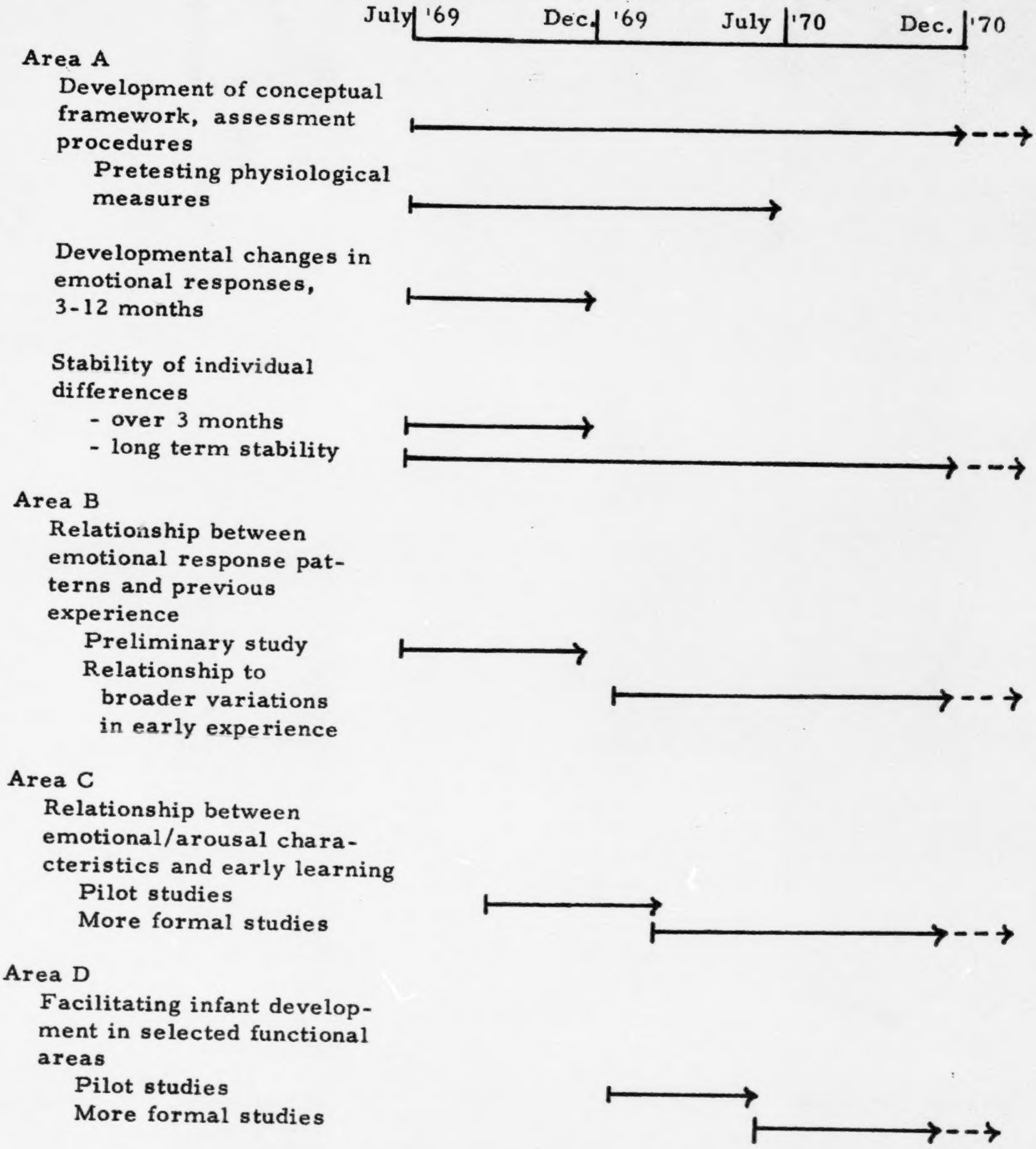
Flow chart attached.

Our first formal study (Project C-DA) which focussed on developmental changes in 32 infants from 3 to 12 months of age, assessment of short term stability, and a pilot investigation of the relationships of infant responses to previous experience, will be essentially completed by the end of the present contract year.

During the following contract year, we will continue to work on the conceptual and methodological problems involved in the assessment of approach-withdrawal, arousal, and pleasure-displeasure responses in infants, (including further work on the utility of selected physiological measurements such as heart rate, breathing, and EEG). Also, we will follow and retest a few children from our first study to examine long term stability in emotional response patterns.

Major research efforts during the next contract year will be directed toward objectives 3, 4, and 5 listed above (referred to as Study Areas B, C, and D in attached flow chart). General plans for our research in these closely inter-related areas are outlined briefly in the Project Summaries which follow (C-DB, C-DC, C-DD).

PROGRAM: Cognitive and Emotional Development in Infancy



C-DB

Title: Influence of Previous Experience and Stimulation on Emotional/Arousal Characteristics in Infants

Principal staff: Henry N. Ricciuti, Robert Poresky

Purpose, objectives, or goals: To examine inter-relationships between infants' approach-withdrawal, arousal, and affective characteristics and the nature of previous experience. Of particular concern here are the magnitude, quality, and diversity of environmental stimulation provided by the infant's inter-personal as well as material environment.

Importance, need, or justification: The impact of early experience on development in the first few years of life is one of the very basic problems in the field of child development. In the present research, we are particularly concerned with the manner in which the infant's previous experience influences (or is influenced by) his mode of responding to the environment impinging upon him at any given time, particularly in terms of approach-withdrawal, arousal, and pleasure-displeasure tendencies. Variations in these response tendencies are important not only in their own right, but because they are seen as greatly influencing important perceptual-cognitive, learning, and problem solving behaviors as well. As one example, in contemporary research on the influence of malnutrition and associated sociocultural factors upon mental development, a question of increasing concern has been the problem of whether malnutrition affects intellectual development primarily through central nervous system changes resulting in reduced learning capacity, or through reduced responsiveness or motivation for learning. Clarification of problems of this sort is important not only for theoretical reasons, but also because of the implications which are generated in regard to the planning of environmental modification or intervention studies.

Method, strategy, or design: Our pilot study in this area has involved an assessment of experiential-environmental differences among 32 Caucasian, primarily middle class infants by

Method, strategy, or design (continued)

means of a rather detailed home visit and interview with the infants' mothers. Relationships of these differences to infants' emotional response characteristics are now being analyzed. Subsequent studies will involve two inter-related strategies; comparing infants from backgrounds which are assumed to represent gross contrasts in experience and environment (e. g., middle class, home reared infants versus institutionalized infants with different patterns of environmental stimulation); and, more importantly, comparing infants whose experiential-environmental backgrounds have been systematically assessed and specified as being dissimilar in important respects.

Infants' responses will be assessed by techniques developed in our first study, involving elicitation of emotional responses with systematically varied stimulus situations, and ratings of TV recordings of infants' behavior.

Adaptations of these techniques will be developed for infants over the age of 15 months. Specification of salient components of the infant's previous experience and environment will be accomplished by means of home or institution observational visits and interviews with mothers or caretakers. It would be highly desirable eventually to incorporate in this research detailed information concerning the nature of adult-infant interaction. It is hoped that such observations may become available through collaborative efforts with Drs. Alfred and Clara Baldwin, who are planning to extend their mother-child interaction studies to the infancy period, and/or through collaboration with other investigators in the National Lab at Cornell or elsewhere.

Characteristics of the users and sample:

Infants 3 to 24 months of age from diverse environmental backgrounds, including "culturally disadvantaged" families and appropriately selected institutional samples if possible. It may be possible also to secure valuable data on a sample of children being studied longitudinally in a village near Mexico City

Characteristics of the users and sample (Continued)	by Dr. Joachin Cravioto, who has long been interested in the influences of malnutrition and associated socio-environmental influences on children's development. Detailed information on the home environments of these children is already available.
Expected end products of results:	Interview and environmental analysis procedures for assessing previous experience and stimulation; technical reports.
Evaluation Procedures:	See "Method" above.

C-DC

Title: Inter-Relationships Between Emotional or Arousal Characteristics in Infants and Early Learning

Principal staff: Henry N. Ricciuti, Robert Poresky

Purpose, objective, or goals: To examine the relationships between the nature of the approach-withdrawal ("directional"), arousal, and affective responses accompanying the infant's interaction with a given environmental situation, and the impact of that interaction or experience in the modification of the infant's behavior. Another way of putting the matter is to ask whether the effectiveness of various kinds of learning experiences depends upon the nature of the arousal and affective characteristics which the child brings to the situation as stable individual response tendencies, or which are instigated by the nature of the learning situation itself.

Importance, need, or justification: The relationship between levels of arousal and the quality or effectiveness of an individual's performance is a problem that has held the interest of psychologists for many years. Similarly, the concept that "optimal levels of arousal" are somehow associated with maximal performance or learning is a notion that has been stated in various forms by a good many investigators, most recently by J. McV. Hunt in his discussion of conditions likely to optimize learning and cognitive development in young children. Most of these treatments of the general problem have given little serious consideration to hedonic, or pleasure-displeasure responses associated with different levels of arousal, which the present investigators regard as a matter of prime importance. In a closely related contemporary trend, recent research on perceptual-cognitive development has placed increasing emphasis on the role of attentional and motivational processes involved in such development. While these issues are clearly of theoretical importance, the practical implications of a fuller understanding of the inter-relationships between arousal or affective responses and learning are

Importance, need, or justification (Continued)

equally clear and important. Thus, it may eventually be possible for example, more systematically to maximize the probable effectiveness of experiences intended to foster learning and cognitive development by ensuring that the stimulus situations confronting the infant are capable of generating appropriate kinds and levels of directional, arousal, and affective responses.

Method, strategy, or design:

1. In the initial stages of this research, we will examine closely the approach-withdrawal, arousal, and affective responses shown by infants during the course of various simple problem solving activities (e.g., turning over a bottle to retrieve a pellet, placing pegs in a pegboard, finding a hidden object, engaging in simple object-grouping behavior, etc.). Similarly, infants' arousal and pleasure-displeasure responses will be closely monitored during the course of various operant learning sequences. In both instances, the analyses will examine the temporal or sequential relationships between arousal and affective responses on the one hand, and the effectiveness of learning or problem solving activities on the other.

2. Having identified infants who differ markedly in their typical emotional responses to a variety of stimuli, the question is whether these response characteristics have differential implications with regard to learning and problem solving behavior in situations which vary with respect to the demands of the task, the nature of reinforcement provided, etc.

3. A natural third strategy following from 1 and 2 above involves experimentation to determine whether one can "optimize" conditions for effective learning and problem solving by appropriately modifying the infant's arousal or affective state immediately prior to the

Method, strategy, or design (Continued)	learning experience, through play, pretesting experience, etc. Similarly, can one create an optimal learning context by appropriately accommodating or "matching" the nature of the learning situation itself, especially to the arousal and affective response characteristics of the infant.
Characteristics of the users and sample:	Normal infants, middle class and "culturally disadvantaged," from 9 to 30 months of age.
Expected end products of results:	Technical reports with practical implications concerning the creation of conditions of motivation and arousal likely to facilitate learning and cognitive development in infancy.
Evaluation procedures.	See "Method" above.

C-DD

Title: Facilitating Infant Development in Selected Functional Areas: Some Pilot Studies and Preliminary Guidelines

Principal staff: Henry N. Ricciuti, Robert Poresky

Purpose, objective, or goals: To begin some pilot studies concerned with the facilitation of infant development in selected functional areas by means of systematic experiential modification: to begin to formulate systematic rationales and guidelines as a basis for the development and evaluation of "intervention" procedures and programs of this sort.

Importance, need, or justification: It is eminently clear that our society has become increasingly concerned with the importance of providing appropriate environmental conditions and experiences early in life so as to facilitate optimal psychological and physical development in infants and very young children. This concern has been expressed in part through the development of innovative "group care" facilities for infants, in part through the development of special "educational" programs which are sometimes provided in a group care setting, sometimes through home visits. With few exceptions these programs, particularly the home based sort, have tended to be relatively global in approach and content, with little opportunity to specify the nature of the processes which might be involved in the "training" experience and in the learning consequences of such experience.

The exploratory studies planned here would be based in part on the preliminary results and implications of the studies previously described, concerned with the relationship between the infant's emotional or arousal responses and his previous experience on the one hand, and his performance in learning or problem solving situations on the other. These studies would be designed essentially as rather circumscribed, "micro" intervention or experiential modification studies, in the interest of permitting rather explicit description, analysis, and evaluation

Importance, need, or justification (Continued)

of the "learning" experience and its observed consequences. Moreover, we will be very much interested in the feasibility of modifying patterns of approach-withdrawal, arousal, and affective behavior in developmentally facilitating directions, when this seems indicated, as well as in attempting to foster the development of particular perceptual-cognitive or learning functions more directly.

Method, strategy, or design:

Our general strategy is suggested in the preceding paragraphs. An illustrative design for one of our pilot studies may be summarized as follows. One of the functional areas we expect to deal with is that of early "classification" behavior. The principal investigator has conducted considerable research on the development of such behavior, employing simple object grouping tasks in which the infant's spontaneous manipulation and organization of the objects on the basis of similarities and differences is noted and coded for purpose of assessment. The aim in this pilot study would be to provide some infants with a good bit of experience "playing" with such materials, which are systematically varied in terms of the kind and number of stimulus cues providing a basis for "grouping." The question would be whether systematic experience of this sort facilitates the development of categorizing behavior. Infants would be observed during their exposure to the sorting materials, so that the nature of the experience could be specified. For this reason, the play periods would be fairly short (perhaps 20-30 minutes), but frequent (nearly every day). Optimal duration of the experience in terms of number of days will need to be determined empirically, on the basis of satiation, apparent outcomes, etc. It would be desirable to employ two control groups: one with the same periods of play as the experimental group, but with materials that are not likely to elicit object grouping behavior; the other a control group with no systematic experience provided during the "treatment" period.

Method, strategy, or design (Continued)	Evaluation of the effects of the play experience would be based on a series of procedures designed to assess the cognitive functions presumably capable of being influenced by the "object grouping" experience. These functions would be assessed with a series of tasks ranging from some which are very similar to the "training" materials (i.e., object grouping tasks), to some which are very different (e.g., operant learning tasks calling for discrimination and generalization). Another functional area which might be investigated here is that of concepts of quantity and number. Dr. Ginsburg hopes to conduct some pilot studies next year extending some of his earlier work on the development of concepts of quantification and number to focus on very early manifestations of these "concepts" in children between the ages of 18 and 36 months, approximately. It may be feasible to examine the influence of systematically provided experience on the development of these important cognitive functions as well.
Characteristics of the users and sample:	Small numbers of infants between 9 and 36 months, both normal and with known variations in previous experience and enviroment.
Expected end products of results:	Technical reports with information of general interest concerning problems of methodology and strategy in the design of programs and procedures for facilitating infant psychological development.

KANSAS CENTER FOR RESEARCH IN EARLY
CHILDHOOD EDUCATION

70706-K

Lab. Cate.	Center Code	Program, Project/Activity Title	Principal Investigator
2.1	K-A	Individual Differences, Learning, and Infant Development	F. D. Horowitz
2.1	K-B	Conceptual Processes	J. C. Wright
2.21	-BA	The Use of Programming Procedures in the Development of Preacademic Intellectual Skills for Children 15 months to 5 Years	B. C. Etzel
2.11	-BB	An Analysis of Imitation and Stimulus-Matching Behavior as Response Classes	J. A. Sherman
2.12	-BC	Attention and Cognitive Style	J. C. Wright
2.12	-BD	Mnemonics in Paired-Associate Learning	H. W. Reese
2.11	-BE	Measurement of "Spontaneous Speech" Vocabularies of Poverty Negro and Middle-Class White Preschool Children	Todd Risley
2.22	-BF	The Role of Auditory Stimuli in a Remedial Reading Program for Primary Level Disadvantaged Children	Montrose Wolf
2.1	K-D	Acquisition and Performance of Regulatory Social Responses	Howard Rosenfeld
	K-E	Studies of the Ecological Reinforcers and Teacher Behavior in the Natural Preschool Environment	
2.13	-EA	A Study of the Ecological Reinforcers and Teacher Behavior in the Natural Preschool Environment	Donald Baer
2.21	-EB	Experimental Analysis of Effects of Teacher Attention on Preschool Children's Block-Labeling Behavior	Margaret Cooper

K-A

Title:	Individual Differences, Learning, and Infant Development
Principal Staff:	Frances D. Horowitz, Mary Ellen Mann, Lucile Paden, Kastoor Bhana, Ronald Mann, Robert Aitchison, Elizabeth Boyd
Purpose, objective, or goals:	The main objective of this project involves the identification and use of reliable measures of individual differences in young infants. Those measures which can be reliably demonstrated will be studied for their possible use as dimensions of matching environmental conditions to the infant in order to achieve the maximum control learning behavior.
Importance, need, or justification:	While early infant development is rapid and variable we presently do not understand how these individual characteristics enter into functional relationships with environmental events to determine developmental outcome. This project should contribute in important ways to understanding of such interactions. Individual differences in development have been receiving increasing attention in the last few years (e.g. Escalona, 1968). While this attention has been focused upon describing dimensions of individual differences there is little experimental research attempting to demonstrate the role of these differences in learning. Recent data from this project (Horowitz and Paden, 1969) suggest that experimental procedures often tend to limit infant behavior and to therefore obscure the range and variability of individual differences in infant behavior. Ultimately, knowledge of the functional interaction between individual difference characteristics and environmental events should lead to greater control over the arrangement of events so that they constitute the optimal learning environment possible and thus insure a certain degree of acquisition.

Method, strategy,

The research plans include the following:
A. Exploration of indices of individual differences - at the present time our data suggest individual stability with regard to differences in duration of visual fixations and trials to habituation. Our next step is to determine which procedures of quantification provide the most stable index and the clearest subject differentiation. We will be trying to determine the variety of quantification procedures that can be used and we will try to objectify the advantages and disadvantages of each approach in attempting to arrive at the most useful set of quantification procedures.
B. Expansion of measures obtained on infants - the use of heart-rate has been a disappointing measure at the present time. Part of the difficulties with this measure have involved a poor recording of the heart-rate. New equipment and some modifications of the procedures we have been using promise to increase the yield of this measure. We shall be looking for a relationship between patterns of heart-rate changes and patterns of orderly response changes. For this purpose we shall simultaneously record heart-rate and other responses - such as visual fixation - in all of our subjects. Further measures will include electromyograph recordings and limb movements. We shall also begin to obtain some measures of response acquisition in a variety of discrimination learning problems with longitudinal infants and relate these to the response performance measures obtained. The further expansion of measures involves the use of the Brazelton scale which will be used by Ricciuti at the Cornell Laboratory and which is currently being used by Dan Freedman at the Chicago Laboratory. This particular scale is described in the next section.
C. Begin observations of infants at birth - Dr. T. Berry Brazelton in collaboration with Dan Freedman has developed a newborn assessment scale which involves dimensions of assessment that seem particularly useful to the goals of the individual differences project at Kansas. Horowitz and the infant lab coordinator, Lucile Paden, received training on this scale and will begin to obtain data from newborn

infants in the local hospital. When these infants are approximately three weeks of age a number of them will come to the infant laboratory and a reassessment will be made and these and the earlier measures will be investigated for their relationship to the response measures normally obtained in the laboratory. By taking similar measures at birth, at three weeks and each week thereafter for about three months, it is hoped that the degree of individual stability in a variety of response dimensions can begin to be understood. This is an essential area of information if we ever hope to understand the role of individual differences in early learning and developmental outcome. Henry Ricciuti of the Cornell Center will also be using this assessment and we expect to be able to compare data.

D. Interaction between infants and their caretakers - the thrust of this aspect of the infant laboratory will be in collaboration with another principal investigator, Rosenfeld, of this laboratory. We are beginning to explore the procedures for collecting and analyzing patterns of mother-child interaction and for developing experimental manipulations which will reveal the functional relationships which exist in these interactions. Within this context we shall also be looking at specific aspects of language behavior in an attempt to understand the degree of modification mothers make in their verbal behavior relative to the infant's verbal behaviors. Some of this work will involve the collaboration of Dr. James Sherman.

E. The relationship of individual differences in response performance and response acquisition - in this aspect of our work we shall be relating the indices of individual differences in response performance, such as duration of habituation of visual fixations, to optimal and non-optimal stimulus conditions in response acquisition. Here we shall begin to determine whether the matching of certain stimulus conditions to particular dimensions of individual characteristics can be used to facilitate response acquisition and conversely, whether the mis-match of conditions can hinder response acquisition. To the extent that we can experimentally manipulate response acquisition we shall begin to understand the functional role of individual characteristics in development.

Characteristics of the users and sample:	Sample: The target samples involve infants from newborn to about six months of age from all socioeconomic and racial-ethnic groups available in Lawrence, Kansas. Users: The ultimate users of the data will be pediatricians and psychologists as they assess and prescribe optimal conditions for children.
Expected end products of results:	The results of this research should be reported in publications and in papers at scientific meetings.
Evaluation procedures:	Our methods of analysis include both individual subject design and group analysis of the data with appropriate statistical techniques (analysis of variance, where possible). In addition to the physiological measures indicated above we use human observers to record such behavior as head turning, visual fixations, and state. Automated measures include patting and kicking responses and will involve vocalizations.

K-B

Title: Conceptual Processes

Principal Staff: John C. Wright, Barbara C. Etzel, Hayne W. Reese, James A. Sherman, Todd Risley, Montrose M. Wolf

Purpose, objective, or goals: The general objective in this program can be described as focusing upon efforts to understand the functional relationships which determine cognitive or conceptual response competencies in preschool children. Thus, the preponderance of the projects within this program are either investigating the response repertoires which young children have (e. g. naturally occurring spontaneous language and normally used patterns of attending and search behavior) in cognitive and conceptual behavior, or are investigating how different arrangements of objective stimulus materials influence concept learning. The sub-objectives of this program are separately described below.

Importance, need, or justification: The rationale which supports the inclusion of this program is almost self-evident. The most basic problem we have in controlling early development is specifying the optimal "curriculum" of early experience necessary to adequate intellectual development. Our difficulty in accomplishing this task lies in the meagerness of our understanding about early cognitive development - the variables which influence it, the significant responses which characterize it, and the degree of stimulus manipulation which will alter it. The projects which comprise this program in the Center form a variable attack on different aspects of conceptual processes from programming of materials to investigating imitative behavior and attending behavior, to studying natural language production. The projects in this program relate directly to all other programs through the use of the longitudinal population. In addition specific sub-projects interrelate with other programs and sub-projects in ways described below.

Method, strategy, or design: This program is not so much characterized by a program strategy or design as it is by the grouping together of highly related projects. It first became apparent that this grouping was especially meaningful when we considered the importance of keeping track of the multiple use of subjects by various sub-projects. Subjects participating in some of the pre-academic programming studies needed to be identified and reviewed separately if they then participated in some of the match-to-sample research. The sub-projects in this program are, for the most part, parallel to each other rather than sequential. It might have been possible to sequence the questions so that some projects would be done now and others later. This seemed a less fruitful and efficient approach for a number of reasons. The resources for conducting the research in the persons of the principal investigators exist now; the data from one project are likely to feed into the data in another project but in a criss-cross fashion rather than in any preconceived sequential fashion.

The procedures of the entire program with the exception of one of the sub-projects involve experimental designs. The one exception is in the study of naturally occurring language behavior which primarily utilizes an observational procedure.

Characteristics of the users and sample:

Sample: In addition to the use of the longitudinal population subjects, each project in this program will use a variety of non-longitudinal subjects. These range in age from fifteen months to eight years with the number of subjects to be used within each project described below. Ethnically and socio-economically the samples include black and white children from lower to upper-middle class.

Users: The groups which will ultimately be served by the products or results of this program include the whole range of primarily normal black and white youngsters from the toddler age through the early elementary school age. Primarily, however, the data are likely to benefit preschool aged children in individual and group learning situations.

Expected end products of results:

The end products of the projects in this program are of three kinds: (1) actual programs for sequencing materials so as to facilitate the acquisition of pre-academic skills; (2) identification of relevant variables which allow the manipulation of verbal learning, imitative behavior, reading behavior, and information processing behavior; (3) reliable baseline data on spontaneous language behavior in lower and middle class preschool children.

Evaluation procedures:

The strategies followed in the program for insuring that objectives of each sub-project can be assessed validly lie in an evaluation of the design of each study. In the review and evaluation meetings the staff and others concern themselves with problems of adequate design. In the inclusion of two of the more recent projects, for instance, an outside consultant was asked to provide a critical review of the projects and an internal committee of the Center staff provided a further review and recommendation as to the inclusion of these projects in the program. Critical future decisions will be made through the internal and external review procedures which have, so far, proved to be stimulating and helpful.

Flow chart, time schedule:

The following diagram indicates the initiation and continuation of each project, and in one case, the termination of a project. See attached.

Resources:

Since this program involves the recombination of already existing projects there are no new especial resources necessary.

K-BA

Title: The Use of Programming Procedures in the Development of Preacademic Intellectual Skills for Children Fifteen Months to Five Years.

Principal Staff: Barbara C. Etzel, Mike Mintz, Wallace Dial, Marilyn Winslow

Purpose, objective, or goals: (1) To develop preacademic skills through programming procedures for toddlers and preschool children. The skills selected are those presently considered relevant to future successful academic behavior during the primary grades of formal schooling. (2) To develop assessment procedures to determine which children should be programmed and in what areas. (3) To develop procedures for assuring generalization of skills (if needed) following the acquisition of that skill, (4) To determine, by follow-up procedures, the success of our "guesses" regarding "relevant academic skills" toward which the preacademic programs are developed (Longitudinal Sample).

Importance, need, or justification: The prime population which this project focuses upon are those children from fifteen months to five years that do not acquire or have not acquired the preacademic skills guessed to be essential for entrance to formal schooling. Many children acquire these skills from their natural home, community and preschool environment. Those that do not are the target population for this project. Research over the past year from this project indicates that approximately twenty to twenty-five percent of the children found in preschool classrooms (both Head Start and middle-class preschools) are candidates for special preacademic training. By both training and developing special programs for these children it will be possible to understand more about how children learn and also to aid in a directly applied manner those who are potential primary grade failures. This project relates directly to the other projects under conceptual processes. Many of the techniques found to be functional in Reese, Sherman, and Wright's projects can be encorporated into this study and vice-versa. Also since programming procedures are being used in both Wolf's and this project there is every indication that a clearer technology of programming can be approached by these two closely interrelated studies. This project is also directly related to many other centers' programs where they are also finding a group of "hard core" preschoolers who do not learn from the usual preschool curriculum. Hopefully as the products of this project are produced they can be further utilized and tested in these other center classrooms.

Method, strategy, or design and evaluation procedures:

The basic strategy has been to choose a total preschool classroom (usually between sixteen and twenty children) for training purposes. The general design calls for assessment of a skill (pretesting); training of the skill for those children not evidencing the behavior (programming); reassessment procedures for criterion behavior (posttests, retention posttests, generalization posttests). This aspect of the design is from an individual analysis approach. A group analysis of the data is also used. A portion of the group of children not evidencing the skill are not immediately programmed. These children are held for a time control to evaluate whether or not they will acquire the skill as they proceed through the regular curriculum of the preschool. After the programmed group has completed their training, the time control group is reassessed, and then trained if necessary.

Characteristics of the users and sample:

Sample: (1) Both middle-class and Head Start preschool classes with children between the ages of three and five. (2) Toddler class at the University of Kansas (ages fifteen months to three years) where the first of the longitudinal population will be picked up during the coming year as they become of age.

Users: The ultimate users of the products from this project will be Head Start and middle-class preschoolers who demonstrate difficulty with preacademic skills and an older retarded population where preacademic skills must be taught before formal education.

Expected end products of results:

A. During the past year both gross visual discrimination and fine visual discrimination programs have been developed utilizing an oddity problem. During the coming year refinements of these two programs will continue. Also in connection with these two tasks there will be additional observation and data collected in the natural preschool classroom on a pre and post basis to see further evidence of generalization of the discrimination.

B. Also during the past year two other studies were begun. One begins to deal with relational abstractions (left, right, under, back, top, etc.); and the other with correctional procedures during programming sequences. Both will continue into the beginning of the next budget period in order to utilize both Head Start and middle-class populations. The study programming relational abstractions under a three-dimensional model will then be extended to two dimensional stimuli and finally to the child's own personal orientation (bodily position). The study on correctional procedures in programming is a necessary study at this point since future programming will be more efficiently carried out with the technical knowledge of this type.

C. Two new programs will be developed during this new budget period that will deal with programming other abstractions. One will deal with a classification system using vegetables, fruit, transportation, trees, flowers, etc. The other with sequencing from an arithmetic point of view.

D. The toddler group will also be started during the new budget period where the gross visual discrimination program will be tested and extended if necessary. Also a color program (revised from a pilot program developed earlier) will be tested.

K-BB

Title: An Analysis of Imitation and Stimulus-Matching Behavior as Response Classes.

Principal Staff: James A. Sherman

Purpose, objective, or goals: To develop response classes of imitation and stimulus-matching behavior in children and to investigate those conditions which facilitate or restrict generalization of the classes.

Importance, need, or justification: The concept of a response class promises a potentially useful tool for the analysis of a number of complex behaviors involved in language development and abstract learning. This research should yield information as to how some response classes may be developed and extended.

Method, strategy, or design: Response classes of imitation and stimulus-matching behavior will be established in subjects lacking these repertoires (retardates and lab animals) and elaborated or specialized in subjects already generally skilled in these abilities (normal preschool children). A variety of procedures will then be examined as possible ways to extend or restrict the variety of behaviors included in the response classes of these subjects.

Characteristics of the sample: Sample: Normal preschool children, and retarded children who initially lack imitative and stimulus-matching repertoires will be employed for both series of studies. In addition, laboratory pigeons will be used in one study of matching.

Expected end products of results: This research will yield information and extension of important response classes in children, and will thereby facilitate the developmental analysis of complex behaviors such as imitation and language.

Evaluation procedures: The behavior of subjects in the experimental situations will be recorded by human observers (for imitation) or by electro-mechanical devices (for stimulus-matching behavior). Where human observers are required, appropriate reliability measures will be taken.

K-BC

Title: Attention and Cognitive Style.

Principal Staff: John C. Wright

Purpose, objective, or goals: To investigate the processes by which children learn what features of a problem-solving or information-processing task are relevant and informative (effective deployment of attention) in relation to potentially modifiable individual differences in rate and precision of visual and auditory searching and matching (cognitive style). To attempt to bring both of these classes of behavior under experimental control and to test for the generality and permanence of improvements in perceptual and cognitive performance so induced.

Importance, need, or justification: Children of equal intellectual ability often differ radically in the style with which they approach and solve problems. This is especially so in the many sorts of problems where early discrimination of relevant from irrelevant cues and consequent effective attention deployment are critical to solution. In particular, with tasks in which speed and accuracy (or attention to detail) are negatively related, about one-third of any sample of children are characteristically fast, but error-prone ("impulsive"), while another third are slower, but more accurate ("reflective") than the remaining average third of the group. Educators and psychologists have long been aware of these stable, generalized, and hard-to-modify individual differences among children, and recently a number of investigators have demonstrated both the generality and the developmental primacy of such differences.

One key to the structure of these differences in cognitive style appears to be the ways in which young children learn selectively to attend to different sources of stimulation in the environment (these sources being distinguished by sensory modality, physical locus, or other characteristic identifying features that serve to identify a particular source). A number of systematic differences in visual observing behavior have been noted by recent investigators, some of which appear to be susceptible to experimental modification.

Under this proposal previous work undertaken with school-age children would be extended to the preschool level. At this age an increase in effectiveness of attention deployment should lead not only to improved performance in formal learning situations, but to increased flexibility of the child's cognitive style--an ability to work slowly and cautiously in situations requiring attention to precise detail, but correspondingly a capacity to estimate, intuit, make rapid judgments, and avoid compulsive, redundant routines when the task at hand calls for such a strategy.

The research questions to be addressed thus include the following: (a) How do children acquire and flexibly generalize routines for finding informative cues and for discriminating relevant from irrelevant information sources in visual arrays? (b) Can such routines be classified in terms of their efficiency and generality for the child? (c) Can the investigator specify such optimal routines in sufficient detail and generality so as to be able to shape them in children as young as four to six years? (d) Once acquired, whether by specific training or by unstructured experiences in a comparably enriched learning environment, how broadly can such routines be generalized? That is, can the child apply them widely and flexibly to entirely different problems that nevertheless have the same formal and logical properties as those on which the routines were originally established? And finally, (e) How enduring are such routines or strategies--how long are they retained without further prompting or training?

If the early phases of the project are successful in producing coherent results, two related questions of similar importance will be studied: (f) Can preschoolers acquire two alternate styles of information seeking (reflective and impulsive, for lack of better terms) in such a fashion that they serve as discriminative responses under differential stimulus control? If so, can this control be transferred from arbitrary stimuli in the laboratory (e. g., a red "go-slow-and-be-careful" light vs. a green "hurry-up-and-make-a-guess" light) to distinctive classes of problems as discriminanda (e.g., multiple response, imaginative, divergent thinking, and verbal production problems responded to as "green light" conditions, while problems requiring perceptual analysis, convergent thinking, discrimination of relevance, or systematic exhaustion of logical possibilities are responded to as "red light" conditions)? (g) To the extent that reliable diagnostic procedures for assessing cognitive style can be developed for preschool children, an important contribution can be made by studying the Kansas Center for Research in Early Childhood Education longitudinal sample (now infants) in an attempt to determine what infant behaviors are correlated with subsequent tendencies toward impulsive or reflective cognitive styles, and with the ability to acquire differential styles depending upon task requirements.

Method, strategy, or design:

With a modification of previously designed apparatus, four to six year old children will be initially screened for reflection-impulsivity, then extensively trained to respond in one style or the other, and subsequently evaluated on match-to-sample and other discrimination learning problems wherein the occurrence, frequency, and duration of observing responses to (or looks at) each stimulus are directly recorded. Auditory feedback and tangible reinforcers will be used in Study 1 to shape the speed of response (time-contingent schedules) and later in Study 2 to shape the sequence of observing behaviors (look-contingent schedules). In both studies some children will be trained to respond rapidly and intuitively, others to respond slowly, cautiously, and systematically, modes of response that correspond to the impulsive and reflective cognitive styles, respectively. Immediate posttesting and a six-month follow up retest will be designed so as to assess not only retention, but also generalization of experimentally induced changes in rate and style of information processing, as well as concomitant changes in the distribution and sequencing of observing responses. The range of such generalization tests may include paired-associate learning, concept formation, tests of conservation, performance sub-tests from IQ batteries, perceptual tests such as imbedded figures, and tests of divergent and generative thinking and imagination.

In Study 3 (Differential styles), another sample of preschool children will be similarly assessed, but differentially trained to respond slowly and cautiously or rapidly and intuitively, depending upon the presence of a discriminative stimulus (red or green light, for example). At first the problems will be identical so that only the light has control over response speed and style. Over a number of sessions, however, the type of task associated with each light will begin to diverge so that (for all but a small control group which is reversed) production tasks will be associated with the green light and require rapid intuitive response while analytical tasks will be associated with the red light and require slow and systematic response. Then an attempt will be made to fade out the light cues. As before, the occurrence, frequency, duration, and sequence of observing responses will be directly recorded and analyzed with data on response speed and accuracy, as in the first two studies.

Study 4 (KCRECE Longitudinal sample) will work with the longitudinal sample now being studied under Dr. Horowitz's infancy project. Due to the youth of this sample, little work will be accomplished with them during the first year of this project, but a preliminary screening of observational data collected by Dr. Horowitz and her staff will be undertaken. The categories to be assessed at this level include such possible style precursors as reactivity to social and physical stimuli, apparent attention span as estimated from eye-movements, and the like. Later, as they approach preschool status, the members of this sample will be assessed on standard instruments for reflection-impulsivity and their relative standing will be compared with predictions made from the infant data. Perhaps a differential training study similar to proposed Study 3 (above) can be conducted with this population as well.

Characteristics of the sample:

Sample: Initially a population of four- to six-year-old children will be studied. The children will be recruited from two sources: (1) Children attending private nursery schools, day-care centers, public and private kindergartens, and the University Preschool. (2) Children enrolled in Head Start or equivalent programs in Lawrence, Topeka, or Kansas City. Where feasible, comparisons between these two source populations will be made. In addition the Kansas Center's longitudinal sample will be used as soon as they are old enough, perhaps at age three if instruments modified for that age prove to be effective when pretested in the Kansas University Toddler Center.

Expected end products of results:

A conceptualization of cognitive styles in attentional and perceptual terms together with procedures for identifying quite early children who are either excessively impulsive or excessively compulsive in information processing tasks. Development and evaluation of training procedures and devices which might be adapted for remediation of such problems in children too young or too educationally handicapped to profit from verbal materials and conventional instruction. Development and evaluation of a pre-academic training program designed to elicit a differential attentional and cognitive style depending upon the requirements of the task at hand. That is, the ability to discriminate tasks which call for a high rate of emission of relatively unselected responses from tasks which require a low rate of emission of carefully selected and systematically evaluated responses; and the ability to act accordingly both in terms of task response and of attention deployment strategy.

Evaluation procedures:

Human observers will record accuracy of choice responses in match-to-sample and discrimination learning tasks. Event recorders operated by the subject's self-exposure display panel will record his observing behavior. Timers will be started by the experimenter on each trial and stopped by the subject's first choice response. Reinforcement decisions and delivery will be manually controlled by the experimenter. Both meaningful (familiar) and geometrical (complex and unfamiliar) stimuli will be used in the tasks. The posttest and follow-up batteries will consist mostly of tasks that are manually administered, timed, and scored, and that have the general property of yielding negative correlations between speed and accuracy of response. The design of most of the studies contemplated will contain two source populations (Head Start and pre-school), two or three subject types (impulsive, reflective, other), two training conditions (contingently shaped vs. control--generally enriched), and will evaluate change scores (pretest vs. posttest, or pretest vs. six-months retest) on speed, errors, and some twenty observing response variables (e.g. percent of looks devoted to the standard stimulus, percent time spent looking at the alternative finally chosen on that trial, and the like) as the dependent variables. Individual curves will also be plotted during training, and considerable attention will be devoted to the analysis of individual progress during that phase.

K-BD

Title:	Mnemonics in Paired-Associate Learning
Principal Staff:	Hayne W. Reese, Drenda Farmer
Purpose, objective, or goals:	To study roles of visual imagery and verbal context in learning and retention of verbal materials.
Importance, need, or justification:	There is evidence that the deficiency in learning by culturally deprived and intellectually deficient groups is largely attributable to failure to utilize efficient strategies or techniques of learning and retention rather than to deficiency in learning and retentive capacities. The research being undertaken is designed primarily to provide a baseline or framework against which such groups can be evaluated.
Method, strategy, or design:	Two basic paired-associate learning procedures are used: (a) each item is presented verbally and visually and the response is verbal, or (b) each item is presented only visually and the response can be verbal or motoric. In both procedures a Control group receives the items in each pair as separate, isolated elements, as in standard paired-associate methods. A Verbal-Context group, in Procedure (a), receives the same pictorial materials as the Control group, but the items in each pair are embedded in a complete sentence that describes an interaction between the stimulus and response items. An imagery group sees different pictorial materials, showing the stimulus and response items in a pair interacting in some way. In Procedure (a) this last group hears the items presented as separate, isolated elements. The design is illustrated in Table 1.

Table 1

Basic Design

Visual Presentation	Verbal Presentation	
	Isolated Elements	Interactions
Isolated Elements	Control	Verbal Context
Interactions	Imagery	---

In Procedure (a) all three conditions are used; in Procedure (b) the conditions in the first column are used, but with no verbal presentation of any kind.

With Procedure (a), which has been used to date, the materials are presented manually by the experimenter on flash cards. An apparatus (described in the Annual Report) has been constructed for Procedure (b) to allow automatic presentation of the materials, and one hundred slides have been made for the initial experimental work using this procedure. A "study-test" method will be used; the entire list is presented, one pair at a time, on a "study" trial in which the subject makes no overt responses, then the stimulus items are presented one at a time with an array of response items. There is a push-button below each response item. The subject is to select the appropriate response item from the array, indicating his choice for each stimulus by pushing the button below one of the response items. After this "test" trial, further study and test trials are given until the subject achieves a learning criterion.

Experiments Planned: (a) The work completed to date was designed (1) to replicate the initial work with a more adequate control condition than had been used previously, and (2) to test one of the theories of the effects of imagery on paired-associate performance. The replication was successful in that performance in the new control condition was inferior to performance in the Verbal Context and Imagery conditions, but was unsuccessful in that an age trend obtained in earlier work was not obtained. In earlier work it had been found that the Imagery condition was less effective than the Verbal Context condition in four-year-olds, but equally effective in older children. In the replication study the two conditions were equally effective at all ages. Therefore, still another replication is planned to clarify the status of the age trend. The test of the theory was indeterminate, because although the experimental conditions produced better performance than the Control condition in relearning after a two-week interval, retention on the first relearning trial was not significantly different in the three conditions. The trend in the date, however, was inconsistent with the theory being tested: The means were equal in the experimental conditions and greater than the mean in the Control condition. The theory (referred to by Reese, in the symposium attached to the Annual Report, as the "leveling hypothesis") predicts better retention in the Verbal Context condition than in the Imagery and Control conditions, and no difference between the latter two conditions. Other theories (also discussed by Reese) predict equal retention in the experimental groups, better than in the Control condition. Thus, no theory was conclusively supported or refuted. Therefore, the further replication study is also planned to clarify the retention problem.

(b) In pilot work completed to date, it was found that toddlers were unable to learn the paired-associate list when the flash-card procedure requiring verbal responses was used. It is planned to continue the work with this age group, using the new apparatus so that nonverbal responses are possible. According to one theory (discussed by Reese) these subjects might be able to retain material better when it is presented in the context of an image than when it is not, but are unable to "decode" the image verbally. Thus, if the task requires verbal responses, the Imagery condition will produce no effect on performance, but if nonverbal responses are possible, the imagery condition will enhance performance. This prediction will be tested.

In follow-up work, the nature of the interaction described or pictured will be varied (familiar-bizarre, for example), and the amount of detail included in the pictures of interaction will be varied (line drawings vs. composite photographs, for example).

It is anticipated that there will be no difference between the two control conditions. If there is not, then the first control condition will not be used in the follow-up work, since it is technically less adequate than the second control condition. If there is a difference between these two controls, then the initial follow-up work will be designed to determine the cause of the difference.

Characteristics of the sample:

Sample: Normal, middle-class preschoolers, deaf preschoolers, Head Start type preschoolers. Using the new apparatus, groups of deaf preschoolers who lack verbal language will be tested to follow up pilot work done elsewhere by the principal investigator. The pilot work indicated that the imagery condition produced at least as much facilitation of performance in deaf preschoolers as in hearing preschoolers, and possibly more facilitation.

Expected end products of results:

Body of knowledge about how learned material is stored in memory and retrieved from memory for use. It is possible that a standard test assessing the tendency to use efficient mnemonic systems spontaneously could be developed, but it is doubtful that the project will progress to that stage in the first year or so.

Relationship to other center projects and center focus:

Comparison of experimental and control conditions; comparison of different populations.

K-BE

Title: Measurement of "Spontaneous Speech" Vocabularies of Poverty Negro and Middle-Class White Preschool Children

Principal Staff: Todd Risley, Betty Hart, Gaylen Jennings, one observer

Purpose, objective, or goals: (1) Analysis and comparison of the vocabularies, grammar, syntax, etc. of the spontaneous speech, of twelve middle-class preschool children and twelve Negro poverty children.

(2) Recording of the spontaneous speech of six eighteen-twenty-four month old children enrolled in the K. U. preschools. This will be the initial year of a longitudinal study of the language development of children as measured by their spontaneous speech during free play. These children's speech will be recorded during this and the subsequent two years in the K. U. preschools.

Importance, need, or justification: (1) To detail aspects of language which differ between the two groups, thereby providing information relevant to language development programs for disadvantaged children.

(2) To obtain a reliable description of the development of the spontaneous speech of middle-class white children which will provide: (a) a heretofore unavailable account of the development of spontaneous speech with formalized measurement, reliability, and classification procedures, (b) a basis for assessing the spontaneous speech development of poverty and minority group children and establishing norms for our subsequent intervention program with younger children.

Method, strategy, or design: (1) Daily, fifteen-minute verbatim records of each child's speech were obtained by observers while the children were engaged in free play during preschool. These records were transcribed onto IBM cards and will be repeatedly re-analyzed according to various approaches to language classification, utilizing the

K. U. computer. Comparison of the summarized data of the two groups will be made according to each classification in approach.

(2) Similar verbatim records will be taken on the "toddlers." Since almost none of the studies on which the "norms" of language development are based have appeared even minimally concerned about the question of reliability, each daily sample of each child will be taken by two observers simultaneously, to assess inter-observer reliability continuously. From our experience with such recording of older children's speech we are certain that younger children's speech, occurring at a much lower rate and with much poorer articulation, will present a greater problem in recording reliability. Furthermore, it is assumed that the observers will become more "familiar" with the children's speech and will thereby obtain increasingly better reliability with each other as they better "understand" the child's speech. The course of such changes in the observer's recordings will be assessed periodically (i. e. six times per year) having experienced observers, who are not familiar with the children, simultaneously record with the two "prime" observers. This will enable the evaluation of previously published data, as to which aspects might have been susceptable to the characteristics of the observer.

Primarily, however, the data on the spontaneous speech of these young children, collected this year, will constitute the initial year of a three-year longitudinal study of the development of sponteneous speech of middle-class children from homes potentially most conducive to language development. This information will direct our intervention programs in the speech development of poverty and minority group children.

Characteristics of the sample:

Sample: (1) Twenty-four four-year-old children: twelve white, middle-class, from university environs; and twelve Negro poverty children. (2) Six eighteen-twenty-four month old children from homes of university faculty or graduate students, who will likely be enrolled in the preschool for three years.

Expected end products of results:	To identify aspects of language to which our language development procedures might be applied for maximum benefit to poverty children.
Evaluation procedures:	Detailed reliability measures of language records obtained by occasional simultaneous observations of individual children by two observers. All observers at either preschool will simultaneously observe with each other observer during the year.

K-BF

Title:	The Role of Auditory Stimuli in a Remedial Reading Program for Primary Level Disadvantaged Children.
Principal Staff:	Montrose Wolf, Betty Jean Chaney, Mike Davis
Purpose, objective, or goals:	To develop and evaluate a reading program involving supplemental auditory assistance for teaching reading to primary level disadvantaged children.
Importance, need, or justification:	The research will provide a sensitive analysis of the effects of a mild punishment contingency (point cost) on the accuracy of academic performance. If it is possible to achieve greater control over accuracy by the arrangement of a small point cost for incorrect response, programmed instruction which incorporates positive reinforcement, such as our reading program, may be made more efficient in a very simple and practical manner.
Method, strategy, or design:	Point cost and its variations will provide the basis for investigating reinforcement contingencies designed to increase response accuracy in the reading program. In the reading program as it now stands, the children are reinforced for correctly completing the series of questions following each story. Errors in answering these questions result in the subject having to go through the entire story over again (Phase II) and then to reanswer each of the questions. This is roughly analagous to the matching procedure in which the same sample stimulus is presented until the subject produces a correct match. With an application of the procedures described in the Christopherson and Risley matching study, it might be possible to reduce the number of errors on the questions following each story in the reading program. Using this procedure, for example, the children would receive ten points for each correct answer. At the same time, they would lose five points for each incorrect answer. The ratio of add-to-subtract can be manipulated as Christopherson and Risley reported, to guarantee that the subjects will show a net gain in points while still maintaining

a high level of accuracy. If in fact the results of the matching-to-sample research can be replicated with the reading program, inattention to the questions, or guessing or random responding on the answers would be reduced. Further, the children might also be expected to read each story more carefully because each error on the posttest would decrease the number of points they receive for completing the story. The rest of the current procedures would be retained in their present form to allow for an analysis of the effects of using a point cost contingency for errors. That is, the subject would still have to read the story over again if they missed more than one answer out of six. A further advantage of using an essentially identical program is that the existing equipment, with only minor additions, can be utilized.

Subjects and evaluation procedures:

The subjects are seven under achieving primary grade children from low income families. Subjects will be used as their own experimental controls. They will receive stories which will alternately have a point cost contingency for errors. Point cost and no point cost stories will be counter balanced across subjects in order to reduce the effects of differentially difficult stories on the group results. The accuracy of the stories with and without point cost for errors will be compared.

Procedure:

Next year's research will concentrate on improving the accuracy of performance maintained by the automated reading program. While this year's research is still underway and the results are incomplete it appears that the third grade students will show less improvement in their standardized reading test performance than was shown by a group of six grade students who were submitted to a similar program.

One important factor may be that the program's reinforcement contingencies are not as effective as they should be. The data describing the students errors in performance support this analysis. Three third grade students were run for four months in a preliminary analysis of the program's effects. During the first two months of the program the students averaged only fifty percent accuracy. Chance accuracy would have been thirty-three percent. Thus for the first two months they were working at only seventeen percent above chance accuracy. The accuracy improved during the second two months when it rose to seventy-five percent (forty-two percent above chance accuracy). The same pattern of slowly improving accuracy was shown by each of thre three students. The fact that the accuracy did improve even as the grade level of the material increased suggests that the students could have been a great deal more accurate at the onset of the training. Thus the next important step will be to refine the reinforcement contingencies which may be related to accuracy.

Although we have made extensive use of positive reinforcement in the program, we have not given any consideration to the reciprocal of reinforcement, punishment.

Recently, however, several authors have reported results which support the use of mild punishment for incorrect or inappropriate behavior in situations where the subjects are already receiving positive reinforcement for correct or appropriate behavior. The emphasis is still on positive reinforcement but mild punishment in the form of response or point cost, is also arranged. Point cost has been shown to be very effective in changing the form of a response which is under reinforcement control (Weiner, 1968). In a typical situation, Weiner maintains a subject's rate of responding with contingent additions of points on a counter located in front of the subject (the subject is instructed to get as many points on the counter as possible). The typography of the response can be modified by subtracting points (point cost). For example, in order to generate an approximation to the "scalloped" responding on a fixed-interval schedule of reinforcement, Weiner found that it was necessary to reward the subjects with one hundred points on the completion of the interval and to punish the subject by subtracting points for each response prior to completion of the time interval. In this way it was possible to produce changes in the typography of responding under various schedules of reinforcement.

Christopherson and Risley (1969) have extended these results by applying the point cost procedure in a match-to-sample situation. In the match-to-sample situation, subjects are usually reinforced for selecting a comparison stimulus which is identical to a sample stimulus presented either previously or simultaneously. Using a standard matching procedure, these authors report that subjects had only about eighteen percent accuracy when selecting a match from one of eight possible auditory stimuli. However, when points were subtracted for each error that occurred, accuracy immediately went up to fifty or sixty percent and was maintained at that level. Whereas just reinforcing correct matches had produced a lower more accurate rate of responding.

Expected end products of results: The results will be presented in the form of papers and publications providing wide dissemination of what is learned from the research.

K-D

Title: Acquisition and Performance of Regulatory Social Responses

Principal Staff: Howard Rosenfeld, John Trewolla, Richard Levin, Pamela Gunnell, Gail Young

Purpose, objective, or goals: The general aim of the project is to determine the processes by which children learn to regulate their exposure to social stimulation. More specific objectives are (1) to develop an objective observational code of normative responses (particularly nonverbal) in interpersonal settings, and (2) to determine by observation of nonrandom interpersonal sequences, as well as by experimental intervention, which response classes function to regulate social stimulation and how this is accomplished. Of particular interest is the determination of the developmental processes by which the infant acquires his repertoire of regulatory social response habits. The above goals, which were initially proposed as the long-term goals of the previous project period, are expected to produce basic and practical insights into the processes by which the developing child learns to communicate effectively with significant persons in his environment and, relatedly, to exert the influence that is required for his survival and gratification.

Importance, need, or justification: The findings of the project should contribute to the solution to a wide range of pressing social problems, in addition to their contribution to a comprehensive science of social behavior. The problems of communication that have arisen from rapid social change are well know, particularly in their contemporary forms of intergroup conflict (e. g., racial, international, generational). At least part of these conflicts can be attributed to the failure of the child to have acquired the flexible repertoire of social skills necessary to maintain social contact and meaningful dialogue under variable social conditions. The complexities of such skills in terms of their response composition and their timing relative to critical environmental events only recently have been explored (Argyle and Kendon, 1967; Gewirtz and

Importance, need, or justification (continued)

Gewirtz, 1969; Patterson, 1969; Rosenfeld, 1966a, 1966b, 1967; Walters and Parke, 1965) and rarely from a developmental prespective. A relevant contemporary exception is the study by Carpenter, 1969, on changes in selective visual attention of infants to social stimuli. Recent evidence by the investigator also has indicated that there are surprisingly strong effects of peer group nonverbal responses on the classroom performance of preschool children from low income backgrounds (Rosenfeld, 1969). The dearth of empirical evidence currently applicable to these problem areas probably is primarily attributable to the absence of an adequate research technology. The present project, drawing upon an interdisciplinary team of developmental and social psychologists and the provision of efficient data processing facilities, is well prepared to generate relevant evidence, as pilot studies in the first project period already have demonstrated.

Characteristics of samples and of the users:

In the belief that the greatest shortcoming of existing knowledge of the process regulating social stimulation is the absence of early developmental data, a continuing effort will be made to study longitudinally-available infants and significant persons in their environment. Initially these others will be the infants' caretakers, primarily their mothers, with the possible addition of siblings and strange adults. These subjects will be recruited from the community in conjunction with Dr. Horowitz' infant attention project. The primary users of results of this phase of the research are expected to be parents of infants. A second phase of the research, in which children approaching preschool age and up will be studied for their learning and performance of social regulators, will include age mates of the children. Here, the most likely users of the data are expected to be teachers, in addition to parents. Finally, in our continuing search for cultural criteria (i. e., a normative code) of appropriate regulatory social responses, assumed to constitute the end-product of socialization, the investigator's experimental and observational studies of adult influence will be continued, primarily employing available university students and adults from the community. This last interest is viewed as of

Characteristis of samples and of the users: (continued)

secondary relevant to the immediate goals of the National Laboratory, and will be supported primarily through other sources. However, it is expected to contribute substantially to the overall goals of the project by adding a long-range developmental perspective to the socialization of interpersonal skills.

Method, strategy or design, and Evaluation procedures:

For the infant-caretaker study (as well as for the other social combinations referred to above,) the primary strategy will be the sequential alteration of baseline (ecological) and experimental analysis of the individual interacting with his social environment. The baseline phase will consist of videotaping the total social interaction in real-life or simulated caretaking settings, and subsequently analyzing the tapes in detail for nonrandom temporal contingencies between discriminable response classes of the participants. The experimental phase will consist in the planned increase or decrease in rates of one member's response class to determine its effect, if any, on the associated response class of the other member. The experimental probes will be accomplished by verbal instruction if possible (e. g., request by experimenter to caretaker to withhold or increase usage of an activity such as holding, rocking, or talking) or by the introduction or withdrawal of social variables such as alternate caretakers, auditory stimuli, and live and televised visual stimuli. If a given experimental probe is not effective within a criterion period of time, a new experimental treatment will be introduced--again varying the availability of one of a pair of nonrandom interpersonal acts observed in baseline. If, on the other hand, an experimental effect is demonstrated, a new baseline period will be introduced and again analyzed for sequential dependencies. The duration of a session is expected to depend upon the alertness and disposition of the child and the time available to the caretaker. (Application of the baseline procedure to macro-analytic units of behavior in natural settings is illustrated by the study of Gewirtz and Gewirtz, 1969, on children and caretakers of Israeli Kibbutzim; the experimental phase is exemplified in the more restricted but excellent studies of Etzel

Method, strategy or design, and evaluation procedures: (continued)

and Gewirtz, 1967, and Wahler, 1969). Although pilot work already is being done with limited videotaping equipment, the completion of the laboratory through previously and currently requested funds will add precision, flexibility, and efficiency to the study. Precision will result from the updating of videorecording apparatus for greater resolution, flexibility will be possible with the planned remote electrical connection of the video (and general experimental) control center to a set of social behavior laboratories, the infant laboratory, and nursery schools, all currently located within the child research unit in which most of the study will take place, and finally, efficiency will be attained through the acquisition of a paper tape punch interfaced with the experimental and observational equipment, and capable of direct submission of data for analysis by the University's G. E. 635 computer.

Progress in the measurement and analysis of nonverbal dimensions of social interaction has, for the most part, been limited to adult populations to the relative neglect of children. This available information is useful to the present project, however, to the degree that it constitutes a "socialized nonverbal code" which serves as a criterion for the developing child. It also is useful for the analysis of those significant social stimuli in the child's environment that are produced by or associated with adults and older children. The present investigator wishes to take advante of this burgeoning wealth of information to analyze a particular social stimulus condition--the act of caretaking (while the majority of research has emphasized psychotherapeutic situations); and also to contribute to the development of a functional nonverbal scoring system applicable to infants and young children at supposedly critical or optimal phases of the social learning process.

To accomplish these goals, the investigator plans to participate in major conferences and workshops on the analysis of nonverbal social behavior (e. g. , the Glen Cove Conference on Nonverbal Behavior in Social Interaction in June, 1969, sponsored by the Crippled Children's Foundation, in which the investigator is an

Method, strategy or design, and evaluation procedures (continued)

invited discussant and plans to present his current video-tapes in informal workshop sessions attended by international experts on nonverbal behavior); and to work with Dr. Paul Ekman at the Nonverbal Research Project in San Francisco, in which a highly sophisticated laboratory for computerized retrieval of video-taped information recently has been established. The investigator wishes to determine the applicability of Ekman's adult-based comprehensive nonverbal scoring system (Ekman and Friesen, 1968) to our video tapes of children in social interaction and to determine the efficiency of his analysis of our recordings of social interaction sequences.

Miss Pam Gunnell on our local staff will continue her development of Fortran IV computer programs for the analysis of our nonverbal data. Our current programs summarize the distributions of multiple response classes--including combinations--over experimental conditions, and in conjunction with specified context variables both within the behavior of the person with whom he interacts. Programs will be developed for applying sampling statistics to these data (e.g., an exact probability test for frequency distributions partitioned by multiple cross-classified independent variables), and hopefully for the sequential analysis of naturally occurring chains of interpersonal responses.

Finally, to follow up our earlier indications that peers with particular observable characteristics exert strong control over the academic performance of low income preschool children, the procedures previously devised by Rosenfeld (1969) will be continued, but with a more flexible apparatus than has been available in previous match-to-sample studies. In the investigator's previous study, for example, the child could get one in four responses correct by random selection of one of the four available keys--a schedule of reinforcement that can be quite effective in maintaining random behavior. Thus the investigator, in collaboration with an engineering student, has designed an apparatus in which any portion of a visual stimulus display, regardless of contour, can

Method, strategy or design, and evaluation procedures (continued)

be exactly preprogrammed as correct; and a variety of programmable consequences can be applied even in the absence of a visible experimenter. A prototype of the apparatus has been constructed (Fard and Rosenfeld, 1969) and is expected to be applied to the research in the coming project period when stimulus materials are constructed. As in the previous study, (Rosenfeld, 1969) the child will perform blocks of responses each randomly programmed for several levels of difficulty (probably the letter-like form discrimination task developed in the last study, to provide continuity) across four conditions in each session: (1) baseline (alone), (2) observed by adjacent peer, (3) competing with peer, and (4) baseline (alone again). Both erroneous and correct response patterns will be recorded, and observations will be made of interpersonal influence during the two social phases of the procedures.

Expected end products of results:

The project is expected to generate evidence about those aspects of the child's social environment that affect the acquisition and performance of his social responses--particularly those responses commonly labeled "social attachment"; and also the effects of the child's responses on social stimulation from the environment. The data will consist in a set of labeled response (or stimulus) categories with accompanying verbal descriptions and video-taped illustrations which will be useful for both reporting and training purposes. Functional relationships between the responses will be listed in detail through computer printout, and summarized in prose and tabular form. It is assumed that methodological innovations and substantive results will be published in both basic and applied formats.

Title:	A study of the Ecological Reinforcers and Teacher Behavior in the Natural Preschool Environment.
Principal Staff:	Donald Baer, Trudilee Rowbury

Purpose, objective, or goals:

The theme of this research is the possibility of ecological reinforcement inhering in salient materials of the preschool setting. The concept of ecological reinforcement, derived from the writings of J. R. Kantor, suggests that many parts of the environment teach us what they are like, simply in the course of our interacting with them. Kantor's assumption can be stated in terms of the stimulus concept of "control": Our early environment teaches us in multiple ways that to be in control of virtually any part of our stimulus world is a condition associated with better probabilities of diverse reinforcement than the condition of not being in control. Thus, to-be-in-control should acquire conditioned reinforcement value of its own. If it does, then, as a corollary, continuing manipulative behavior towards all controllable parts of the environment is to be expected, even though that behavior produces no other consequences than the ongoing "management" of that part of the environment. If "to manage" has become reinforcement in itself, then it is indeed "ecological"--intrinsic in the environment. Furthermore, and more important, if it is reinforcing to control any part of the environment, then that part of the environment becomes, in effect, a teacher. It teaches us what it is like, by reinforcing us for learning how to manage it. (To manage a thing or a process necessarily is to know something about what it is like).

Preschools deliberately are stocked with a variety of materials supposed to be attractive to young children, and contain within them lessons of value to the child, which he can derive even from untutored interaction with the materials. Thus, blocks are fun to play with, and in the process of that play, the child is thought to gain better understanding of the laws of gravity and the lever, perhaps as well as experience something in the area of aesthetics. Science, art, and self-expression lessons may be projected onto block pay, if this logic is followed. Unfortunately, the validity of that projection is untested.

Purpose, objective, or goals (continued)

A program of research proposed for this laboratory, under the theme "Ecological Reinforcement", has therefore followed two main goals. The first of these is to examine various preschool materials, such as blocks, to see if indeed they do have intrinsic or ecological reinforcing function for the children who may play with them, such that this play is maintained without other extrinsic reinforcement. The second goal is to observe the quality of that play, to see if it shows any quantifiable dimensions of change that testify to the child's having learned something from that play in the process.

Importance, need, or justification:

The evaluation of preschool materials as self-teachers, and the evaluation of what lessons (if any) they teach, has obvious relevance for early childhood education. A program aimed at a comprehensive examination of teaching procedures generally suitable for early education thus may profitably include self-teaching techniques and their results.

Characteristics of sample:

Preschool children enrolled in Edna A. Hill Child Development Laboratory Preschools. These are primarily white middle-class children. There are some black and oriental children as well as children from lower socio-economic backgrounds.

Activity procedure:

Various children have been identified by preschool teachers as either high-rate block-builders in the usual preschool setting, or as zero or near-zero rate block-builders. For both kinds of children, an experimental test of the sensitivity of block-building to extrinsic reinforcement has been applied. The child is encouraged to build with the blocks, and (depending on the experimental condition holding at the moment) is either reinforced for these building behaviors, or is not, by the teacher. The reinforcement offered is primarily social, sometimes supplemented by other types of reinforcement.

Both previously high-rate and previously low-rate block-builders have shown similar sensitivity to extrinsic reinforcement of their block-building activities, so far.

Method, strategy or design:

Four patterns of research are planned for the next year of work. (1) Attempts to develop durable block-building during periods of discontinued teacher reinforcement will be repeated, with spaced sessions designed to avoid previously noted satiation effects. (2) Extensive reinforcement by teachers of block-building by previously low-rate block-builders will be pursued, to see if durable unreinforced activity will result from such extensive prior history in the behavior. (3) Peer involvement will be manipulated as an experimental variable, to see if block-building will remain durable in the absence of the initiating teacher reinforcement, once the child experiences its (possible) function as an entree to peer reinforcement. The third possibility is considered extremely important. It may be that the peer group, which has served as the behavioral basis for maintaining many experimentally produced changes in child behavior after discontinuation of the experimental techniques, can also serve to explain an only apparent ecological reinforcement function of activities like blocks. That is, many children may play with blocks repeatedly not for intrinsic reinforcement inherant in the activity, but because of the relevance of that activity to entering subsequent interactions with peers. It may be found that some children, motivated to enter the peer group but not possessing the relevant social skills to do so, will find that block-building can be one such skill, and will use it for that reason. (4) Even, so it then remains possible that protracted experience with blocks can teach, in an of themselves, and these lessons, if they exist, are still valuable, and their measurement still remains a target of this research.

Expected end products of results:

The results of this study may eventually provide preschool teachers and curriculum designers with a better appreciation of what materials in the school setting indeed succeed in teaching lessons of value; which of them may be trusted to accomplish this with minimal teacher intervention, and which will require systematic teacher support to accomplish their goal; and finally may suggest principle for the better construction of self-teaching materials aimed at valuable cognitive and motor development in preschool children.

Title: Experimental Analysis of Effects of Teacher Attention on Preschool Children's Block-Labeling Behavior.

Principal Staff: Margaret Cooper

Purpose, objective, or goals: Preschool educators are being pressed to articulate and precisely specify skills and achievements acquired by young children before formal schooling begins. To do this it is necessary to show that children are taught "something" during the hours spent in preschool.

The objective of this project is to define precisely what preschool children learn through interaction with typical preschool materials during free play. More specifically, this study will focus on the acquisition of geometric labels while playing with building blocks. The following questions will be asked: (1) What is the effect of contingent teacher attention for the correct geometric labeling of the blocks? (2) What effect does attending to one child for correct labeling have upon the labeling behavior of a second child who is in the same setting, but who does not receive direct teacher attention for labeling? (3) What effect does ten minutes of exposure without contingent teacher attention have upon labeling behavior? (4) What are the effects of repeated pretests (probes) on labeling behavior? Probes will be studied under conditions of probes only; probes with "assimilated free play"; and probes with "assimilated free play" and training. Assimilated free play is a ten minute access time to all the building blocks arranged on shelves as they are during the true free play. During this ten minute session other children will be in other activities. (5) What effect does the natural preschool environment have on labeling blocks? This control group will have no probes, no assimilated free play, and no training or exposure to other child training.

Importance, need, or justification: In keeping with the major goal of the Kansas Center this project is attempting to establish functional relationships between what the child is exposed to in the natural environment and what he learns in that environment. Analysis will begin with children in the longitudinal group when they enter the toddler center and continue through the years in preschool.

In Baer's Center project (#IVA) teacher attention was found to be effective in producing and maintaining high rates of use of blocks. Considering the teacher as a vital part of the child's natural environment this study focuses on specifying teacher attention, i. e., what can teachers do with their attention? Baer's study is asking the question by observing what the child does and looking for quantifiable aspects of the products. This project attempts to specify behaviors and asks under what conditions, if any, are they learned. Both studies compliment each other and together are closing in on the problem of defining preschool curricula. While the area for investigation in both studies is the block building area, other areas will be subject for similar analysis once the methodology and set of basic questions are established.

A previous study (Cooper, 1969) was designed to answer what the preschool teacher is able to teach in the natural classroom environment. Specific skills with building blocks were selected, defined and trained during "free-play" in the block area. Training was the systematic use of teacher attention to prompt and to reinforce specific building behavior (stacking, aligning, balancing).

Using a similar experimental design and a similar training procedure, the present project is aimed at analyzing the acquisition of geometric labels of specific block shapes during an "assimilated free-play" block time.

Method, strategy, or design:

A multiple baseline design (Baer, Wolf, and Risley, 1968) of training with probes of training effects will be used.

Data for the probes will be recorded by a naive experimenter who will present six blocks to each child and ask, "What do you call this?" The experimenter will reinforce each child for correctly labeling the block during the probe. Correct responses will be labeling the appropriate blocks as rectangular blocks, cylindrical blocks, or triangular blocks. Responses will be graphed. Probes will be administered before, during, and after the training procedure.

Each of the three shapes will be trained sequentially (multiple baseline design) to examine the effects of training on the trained and untrained shapes. The training will consist of the teacher labeling rectangular block, cylindrical block, or triangular block. The teacher will verbalize labels contingent upon the child's use of that block and will prompt (ask the child to point to or to label) the child's using the label when building with the blocks. Training could also include making the availability of the blocks for building contingent on labeling. The materials contingent procedure was found to be effective in producing color labeling behavior in a study by Hart and Risley, 1968. Data will be collected on individual subjects grouped in pairs. The design will be replicated over "n" subjects. Two children and a teacher will be in a ten minute assimilated free play session in the block area when other children are in other activities. During this assimilated free play the children will have access to build with all the blocks. All children will have access to the blocks during the true free play period, usually the first hour of each session. Subjects A and B will be paired during a ten minute assimilated free play time with blocks. Subject A will receive specific training for block labeling. Subject B will continue to receive noncontingent teacher attention equal to what he received during baseline and comparable in amount to what Subject A receives during training. Both Subjects A and B will receive probes.

Subjects C and D will be paired during another assimilated free play time on the same days as A and B Subjects. Subject C will be treated the same as Subject A except the baseline will be longer. Training will not begin for Subject C until Subject A is trained. Probes will be given as for Subject A. Subject D on the other hand will receive only the assimilated free play time with Subject C. In order to assess the effect of probes no probes will be given Subject D.

Subject E and F will receive no assimilated free play time with blocks and no training. Subject E will receive probes throughout the study. Subject F will receive only pre and post tests--no probes during the study.

For each subject who does not make correct responses under his particular experimental condition training will be introduced at the end of each experimental condition.

Method of analysis: During baseline and training, an observer will record teacher and child behavior. The recordings will take place during the assimilated free play. Teachers will record time in blocks of children during true free play. A second observer will be brought in to check reliability with the main observer. By observing graphs, daily change or lack of change in labeling behavior can be determined. When a training procedure is not producing change it can be noted readily and another method instituted. The multiple baseline allows one to demonstrate effectiveness of training by observing behaviors not under training simultaneously with the behavior being trained. If the behaviors consistently remain at the zero level until training is initiated it may be concluded that training is functional to making correct probe responses.

Characteristics of the users and sample:

Children attending the University Preschool Laboratory will be the subjects for the study. During the first year subjects will be those who on a pretest had no label for blocks other than "block." Ultimately all children in the Child Development Laboratories will be subjects for training. If training (the contingent application of teacher attention to predefined child behaviors) is effective, then the procedure may be adoptable to any preschool classroom and may be applicable for all preschool teachers in establishing a preschool curriculum.

Expected end products of results:

If data indicate that attention from teachers to specific labeling of blocks increases the child's use of that label and relates to correct responses on probes, then a procedure for teaching young children specific behaviors will have been established. The data may also show that the teaching need not be direct. A child may increase his use of labels as a result of being near a second child who receives prompts and reinforcement for labeling. This result, should it appear, relates closely to the work of Dr. Baer, who is analyzing the effect of peer reinforcement on block building. Findings from both studies should tell us more about peers as agents of reinforcers and thus teachers.

The data may also tell us something about the effects of asking children questions repeatedly over time. Does this procedure in and of itself produce any labeling behavior? Under what conditions, if any, does question asking produce labeling?

Once an effective system of training is established, whether that be specifying teacher attention, probing, being near other children, or having a period of exposure time daily with materials, the system can then be transferred to other areas of the preschool. An effective system could be applied to a preschool curriculum model such as the one developed at the Peabody Institute. Using that model plus the findings from the Kansas Center studies one may be able to outline a series of skills to be observed and taught during a child's preschool career.

Flow chart, time schedule:

1969-70--Data will be collected for the subjects. These subjects will be ones who have no labels of any kind for blocks other than "blocks."

1970-71--Based on results from the previous year and using a similar design, the study will be focused on subjects grouped according to their pretest performance of labeling. In addition to training those children with no labels, similar procedures will be applied to two other groups. Groups will be: (1) Children who have no labels for blocks, (2) children who have incorrect labels for one or two of the three blocks, and (3) children who have incorrect labels for all of the blocks (to be retrained). Children will be observed during their time in the true free play. Polaroid snap shots will be made of block structures erected.

Resources:

Equipment for implementing the project will be those materials already available in the preschool--a set of unit building blocks of which every block is a multiple or fraction of the basic unit size 2 5/8 x 5 1/2 x 3/4. Stopwatches and clipboards will be necessary for the observers. Film and a Polaroid camera plus additional building blocks will be required for the second year.

For the first year no personnel will be necessary. Graduate and under-graduate students will serve as observers and experimenters. The second year additional staff will be required because of the scope of the study and number of children involved. Observers will be necessary to record block time in true free play and to record teacher and child behaviors during assimilated free play.

PEABODY DEMONSTRATION AND RESEARCH CENTER
FOR EARLY EDUCATION

70706-P

Lab. Cate.	Center Code	Program, Project/Activity Title	Principal Investigator
1.	P-A	Central Staff--Administrative	Susan W. Gray
2. 2	P-B	Intervention Studies	
2. 24	-BA	Vertical Diffusion (Mother Study)	Barbara Gilmer
2. 24	-BD	Intervention Study with Mothers and Infants	B. J. Forrester
2. 24	-BH	Major Intervention Study: Contrast of Two Differential Treatments of Mothers	Susan W. Gray
2. 13	-BI	The Vanderbilt-DARCEE Research Project Nutrition and Learning	Susan W. Gray
2. 1	P-C	Ecological Studies	Maxine Schoggen
2. 1	P-D	Basic Child Studies	Corinne Mumbauer
2. 12	-DB	Cognitive Style--Processes of Cognitive Style	Corinne Mumbauer
2. 11	-DC	Character and Personality Development	Corinne Mumbauer
2. 13	-DD	Socioeconomic Factors in Family Problem Solving Behavior	Joan Aldous
2. 13	-DE	Social Rewards as Reinforcers	Corinne Mumbauer
2. 13	-DF	Effects of Distraction Upon Auditory and Visual Discrimination	C. R. Barbrack
2. 3	P-E	Supportive Activities	Gaines Mann
2. 32	-EA	Development of Assessment Instrument	Barbara Gilmer
3.	-EB	Dissemination-Demonstration (funded jointly by OE and OEO)	TBA
2. 21	-EC	Curriculum and Materials Development (funded jointly by OE and OEO)	Janet Camp

Title: Central Staff. Administrative.

Principal Staff: S. W. Gray, M. Matthews, C. Satterfield

Purpose, objective, or goals: Other than the usual purposes of central administration, some goals will be particularly emphasized for the period December 1, 1969, to November 30, 1970: Completion and write-up of projects which will reach termination within the current grant period; the launching of two sizeable new intervention studies (which will demand close articulation with the training and dissemination phases of the operation); attempts to get our non-National Laboratory funding on a more predictable basis, something which has been a chronic problem with us.

Importance, need, or justification: Serves as central coordination of components and handles extramural contracts.

Method, strategy, or design: Much effort has been devoted during the current academic year toward staff development, both through assigning responsibilities more broadly with appropriate backup, and through the use of numerous work groups for forward planning. This should pay off well, particularly with replacement of Director of Research who can make staff development, from the standpoint of research potential and productivity, a major concern. The director's role, at least as attempted, is:

1. guiding the complicated array of projects, and the staffs which comprise them with particular concern for interrelations between research and the training aspects of our operation;

2. staff recruitment, the sine qua non of an adequate on-going program. This last is particularly cogent in the area, with which the National Laboratory is concerned, since workers are in high demand, and funding has not tended to be predictable from one year to the next;

Method, strategy, or design (Continued)

3. working on the continuing, and continual problem of funding. This is a major problem because of the large element of unpredictability and the fact that none of our contract or grant years coincide with the academic year, a severe problem in staffing and in student recruitment;

4. extramural relations.

Characteristics of the users:

Internal: the entire DARCEE staff.

External: here we are particularly concerned with collaboration, which is carried on largely at the program level, and with dissemination, which ranges from the specific technical reports to broad gauge lay treatments on the scope and purpose of DARCEE.

Expected end products of results:

Our main criterion here will be the general health of the DARCEE organism, its quality, and its productivity.

Relationship to other center projects and center focus:

This is the superordinate program of DARCEE. Its role is largely that of facilitating-prodding when needed, pulling in on the reins when necessary, but mostly that of enabling projects to move forward at an appropriate pace.

Most collaborative efforts with other components of the Laboratory, or with persons outside it, will be carried on at the program and project level. Again, the central administration serves as facilitator.

Title:	Intervention Studies
Principal Staff:	C. Barbrack, M. Bransky, I. Buhl, S. Cook (Univ. of Colo.), B. Forrester, R. Giesy, B. Gilmer, S. Gray, B. Hardge, A. Mangels, K. Olley, M. Sweeney
Purpose, objective, or goals:	To improve educability of young children through devising and testing empirically intervention techniques which can be replicated and which are feasible from the standpoint of cost efficiency and the maximum use of less-trained personnel. The specific emphasis of many of the projects in this program is concerned with training mothers to make them more effective educational agents for their children.
Importance, need, or justification:	This program is intended to devise precisely defined intervention approaches, carefully documented and evaluated over time, both with children, parents, teachers, and other persons living in contiguity.
Characteristics of sample and users:	Sample: Low income parents and children (rural and urban), plus middle class comparison groups. Comparisons are made of white and Negro groups, with some limited work with other ethnic groups. Users: Other research personnel interested in intervention approaches, preschool public school programs, welfare and programs designed to enhance the skills of paraprofessionals, Head Start Programs, Parent-Child centers, and educators in general.
Method, strategy, or design:	We are attempting massive intervention over time, for which we are attempting to specify a set of variables that seem to effect long-term improvements in educability. In general, these interventions

Method, strategy, or design: (Continued)

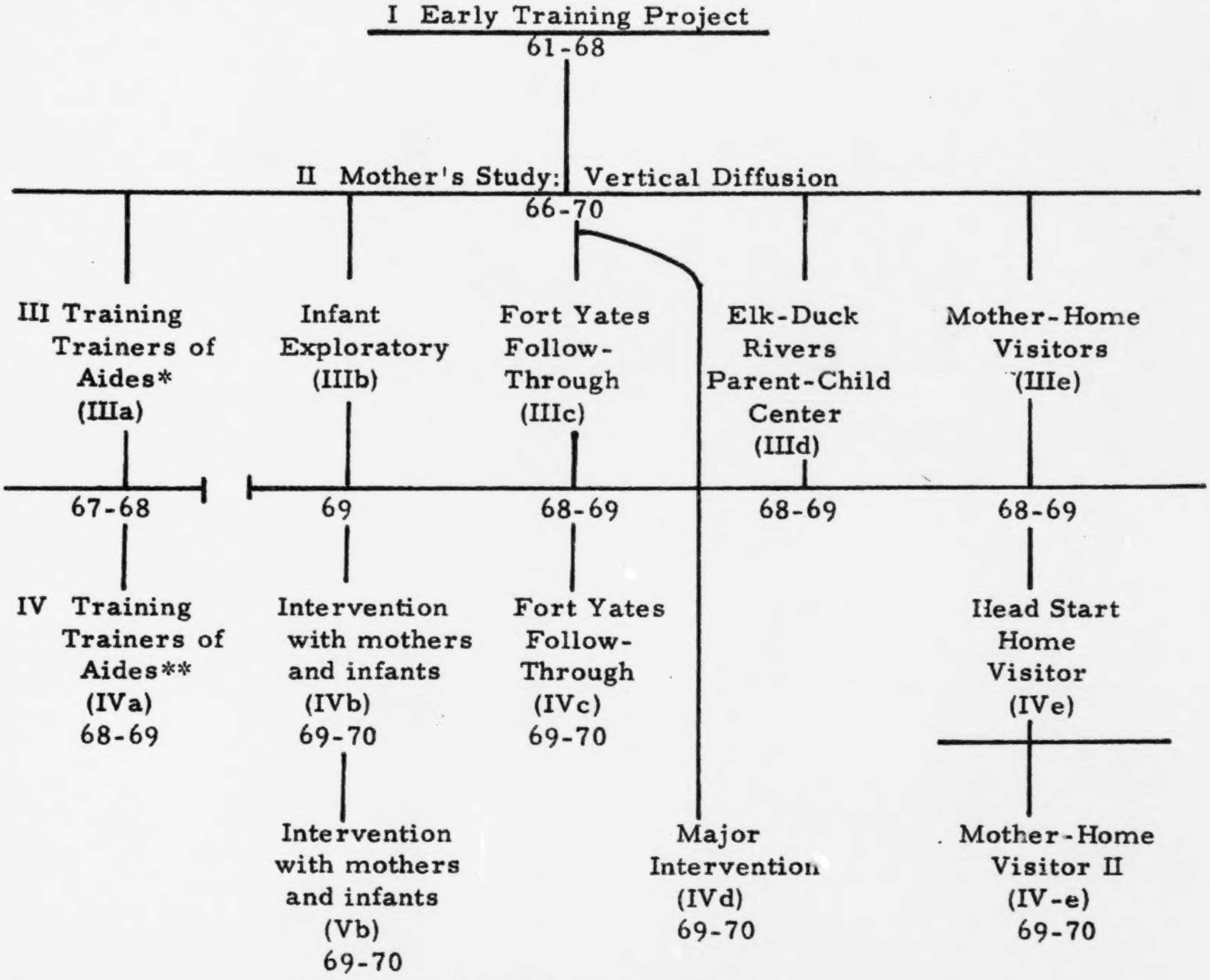
are centered around attitudinal factors and aptitude variables for mother and child. Of particular interest in the child are attitudes relating to achievement such as achievement motivation, persistence, identification with an achieving role model, development of independence and internalized motivational systems. For mothers, we are concerned with the mother's general ability in planning and organizing her life, the development of an effective teaching style with her child, and the imparting to her of a more adequate knowledge of the steps involved in enabling her child to succeed in school. Some other characteristics of our general strategy are as follows:

(1) The use of non-professional personnel trained on one project to train workers on another project (cf. the Mother Home Visitor Study II). (2) An attempt to keep close to treatments involved in a particular study. Large samples in many settings often attenuate so-called innovative treatments so much that little residual is found for appropriate comparisons of contrasting treatments. (3) The general evaluation design is one of pre, interim, post, and follow-up tests with contrasting treatment groups, varying from single comparisons of an experimental and control group to that of comparing four treatments. (4) A concern with diffusion effect both within a family and among persons living in physical propinquinty. (5) Long term follow-up of the subjects involved in intervention treatments. (6) A new addition this year is a greater concern with health and nutritional aspects.

Evaluation procedures:

These have been discussed under "Method, strategy or design." In general, four different assessment approaches are being used: (1) Tests of general

Evaluation procedures (continued)	aptitude at pre, interim, post, and follow-up. (2) Tests of specific abilities toward which our intervention programs are directed (some locally developed; cf. , Project on Development of Assessment Instruments under Program: Supportive Activities). (3) Concrete evidence of changes in performance on part of parents ("life style changes"). (4) Attitude change on the part of mothers with regard to race and type of involvement. (5) Interview data (with parents) directed toward the assessment attitudes related to child's educability and their own life style and potentials for change.
Expected end products of results:	(1) It is anticipated that evidence of vertical diffusion will be observed. This should result in improved academic patterns for young children. (2) Increased effectiveness in training paraprofessionals (including manuals and programs). (4) Home Visitor Programs (materials and instructions) to be used with mothers and young children. (5) Increased teacher effectiveness. In short, (6) more thoroughly validated and precisely defined intervention programs, including a series of curriculum manuals (cf. Supportive Activities Program: Curriculum and Materials Development Project).
Linkages of activities within the program:	Cf. "geneology" chart.
Resources:	Staff: See Table 5. Facilities and Equipment: Two Early Training Center buildings equipped for work with four and five-year olds; three "micro buses for transporting children. Materials: Instructional supplies for four and five-year-olds, for infants, and for mothers.

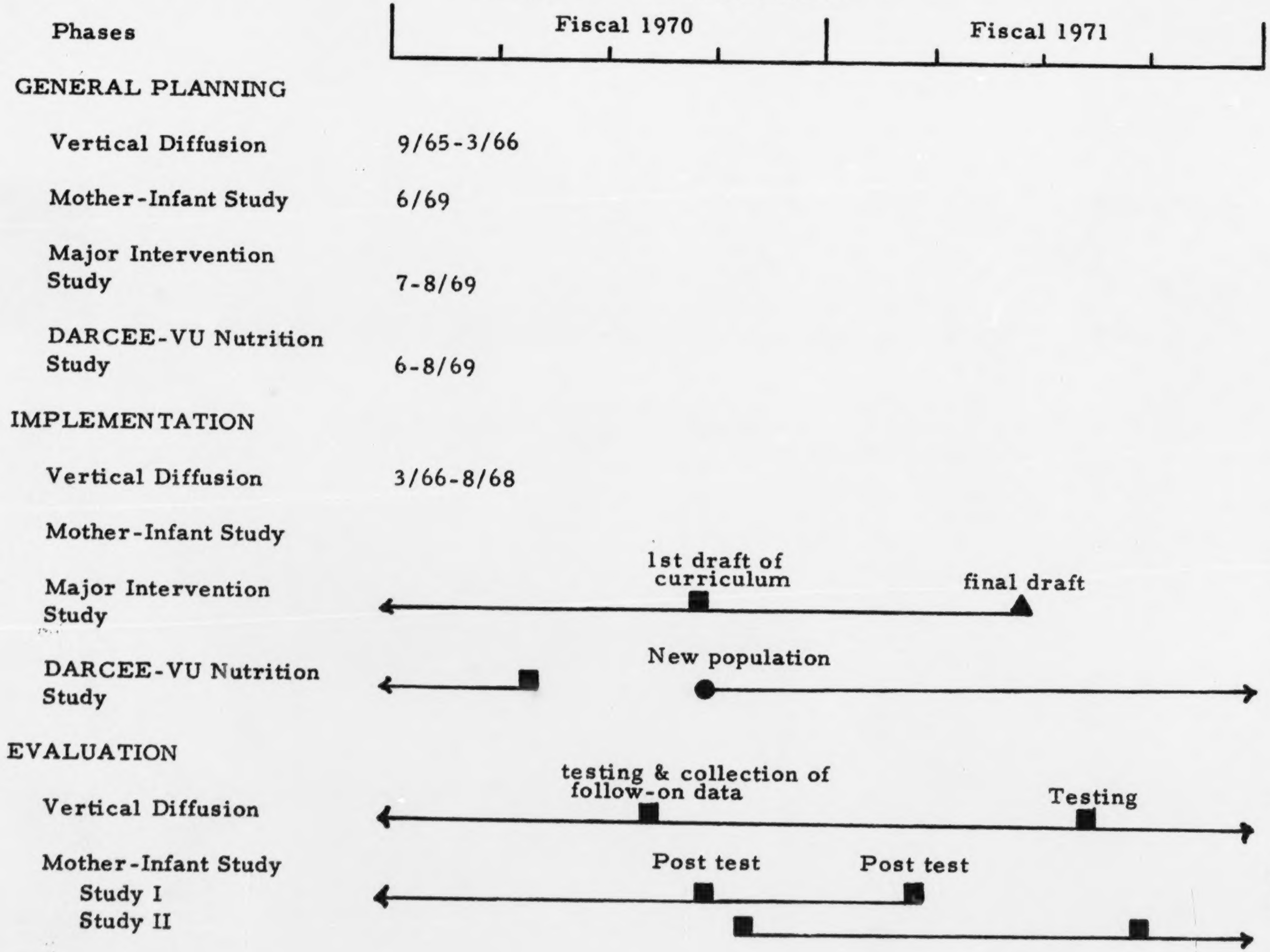

I Early Training Project
61-68
II Mother's Study: Vertical Diffusion
66-70
III Training Trainers of Aides* (IIIa)
Infant Exploratory (IIIb)
Fort Yates Follow-Through (IIIc)
Elk-Duck Rivers Parent-Child Center (IIId)
Mother-Home Visitors (IIIe)
67-68
69
68-69
68-69
68-69
IV Training Trainers of Aides** (IVa) 68-69
Intervention with mothers and infants (IVb) 69-70
Fort Yates Follow-Through (IVc) 69-70
Head Start Home Visitor (IVe)
Intervention with mothers and infants (Vb) 69-70
Major Intervention (IVd) 69-70
Mother-Home Visitor II (IV-e) 69-70

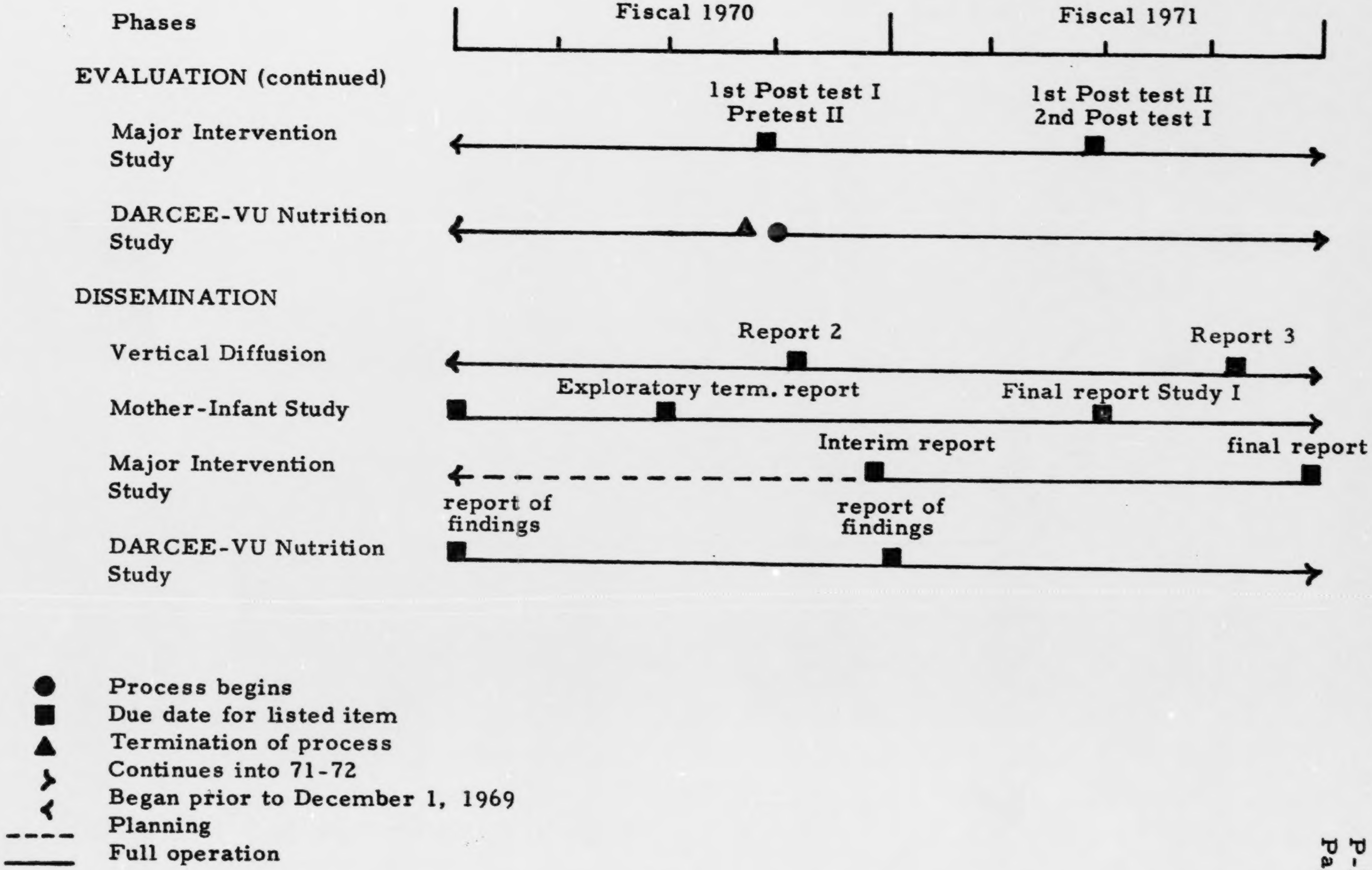
I. Prototype Study 1961-1966 (follow-up continues)
II. Major Intervention Study now in fourth year
III. Studies Stemming from Level II
IV. Studies Stemming from Level III

* The progression is not a simple linear one, as indicated. IIIe and IVe in actual implementation proceed simultaneously; the Mothers' Study continues.

** Linkages across the third generation are close; common approaches and evaluation techniques are being used in part in IIIc, IIId, IIIe, and IVe.

PROGRAM: Intervention Studies




Phases
Fiscal 1970
Fiscal 1971
EVALUATION (continued)
Major Intervention Study
1st Post test I
Pretest II
1st Post test II
2nd Post test I
DARCEE-VU Nutrition Study
DISSEMINATION
Vertical Diffusion
Report 2
Report 3
Mother-Infant Study
Exploratory term. report
Final report Study I
Major Intervention Study
Interim report
final report
report of findings
report of findings
DARCEE-VU Nutrition Study
● Process begins
■ Due date for listed item
▲ Termination of process
› Continues into 71-72
‹ Began prior to December 1, 1969
---- Planning
—— Full operation

P-BA

Title: Vertical Diffusion (Mother Study)

Principal Staff: B. Gilmer, I. Buhl, K. Olley, A. Mangels

Purpose, objective, or goals: The purpose of this study is to conduct a systematic assessment of the agents of change which enhance vertical diffusion of cognitive stimulation within a family. The research focus is on comparison of several methods and procedures of intervening in families from disadvantaged environments. More explicitly, the concerns are to improve the mother's ability to cope with responsibilities of stimulating the cognitive development of their young children. A second major concern is to study the process of development in both the mother and the children within the family. All of the children who were involved in the preschool programs are now in school and are to be included in a follow-on program of evaluation.

Importance, need, or justification: The rationale of the study is as follows: the mother is the chief source of stimulation in the early years for the children in the family and is the agent who imposes the necessary order and structure upon the environment for there to be development of competence and control; the mother also plays a key role in sustaining developed skills and motivating the children to develop more complex abilities during the early years.

Characteristics of samples or users: Approximately 80 families in a 550 unit low-income Negro housing project were identified. Sixty of these families, having a first or second born child of the target age of 36 - 48 months and a younger sibling, were directly involved in an intervention study. Mothers and siblings were assigned to the three treatment groups randomly except where necessity dictated otherwise, with as even a distribution of the children by sex to the treatment groups as possible, and with mothers being as youthful as possible in the mother treatment groups. The other families served as a comparison group.

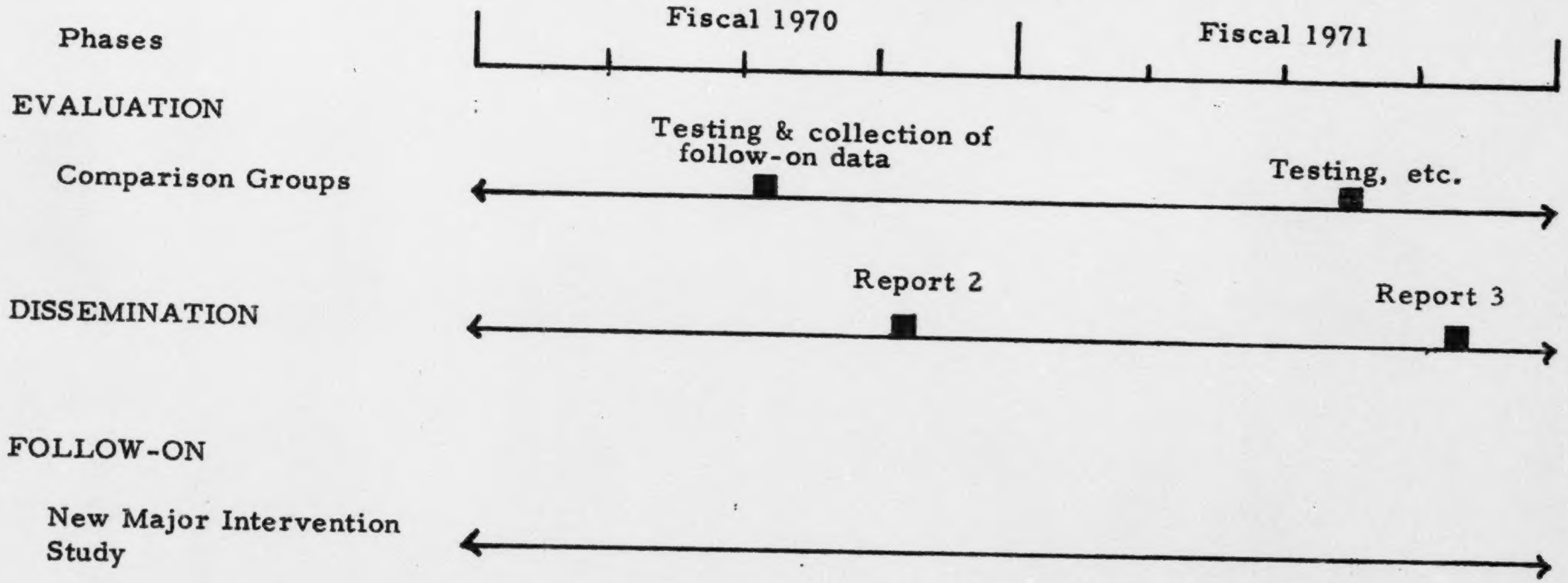
Method, strategy, or design:	The general design of this study included four groups, each of which receives a different treatment: (1) the Maximum Impact Group, in which both the mothers and the children are involved in treatment at Early Training Center; (2) the Curriculum Group with only the children involved in a classroom program that is a replication of the Maximum Impact children's program; (3) the Home Visitor Group, in which only the mothers are involved in treatment with a Home Visiting Teacher, and the children are in no classroom program; and (4) the Comparison Groups of mothers and younger sibling-age children, and of target-age, none of whom received treatment.
Evaluation procedures:	Evaluation has been an ongoing process throughout the program. For the target children the data collected includes psychometric measures, cognitive style changes, and will involve academic achievement indices. The mother will be followed with focus on life-style changes. The younger siblings will be tested periodically, and later school achievement investigated. Interim results on their performance on conceptual style as related to the DARCEE curriculum indicate promising effects of vertical diffusion.
Expected end products of results:	We anticipate the following results: (1) sustained academic achievement for target children; (2) evidence of vertical diffusion; (3) amelioration of potential deficit in achievement patterns; (4) increase in curriculum and materials know-how; (5) increase in teacher effectiveness; and (6) increase in knowledge of early education in general.

The Early Training Center involved in this study was the scene of training of students in preschool education and the demonstration of techniques to visitors. The work done while the Early Training Center was in operation is being pulled together in the form of comprehensive units for use with preschool disadvantaged children. The necessity for adequate instrumentation gave rise to the development and continuing use with the younger

Expected end products of results (continued)

siblings of a measure to assess cognitive functioning. Mothers from the Maximum Impact Group are working as Home Visiting Teachers in the Mother Home Visitor Project, with the techniques developed in the Vertical Diffusion Study serving as a guide both for them and the Head Start Home Visitor Program; these same techniques will be used in the Infant Exploratory Project. With regard to our dissemination efforts, we anticipate that a comprehensive, definitive report will be available for general distribution by November, 1969.

Project: Vertical Diffusion (Mother's Study)


Phases
Fiscal 1970
Fiscal 1971
EVALUATION
Comparison Groups
Testing & collection of follow-on data
Testing, etc.
DISSEMINATION
Report 2
Report 3
FOLLOW-ON
New Major Intervention Study

P-BD

Title: Intervention Study with Mothers and Infants

Principal Staff: B. J. Forrester, S. W. Gray, B. A. Harge

Purpose, objective, or goals: This project will conduct a systematic assessment of the effectiveness of a home intervention program for mothers of infants. There will be a downward extension of some of our home visitor techniques, in order to modify mothers' interactions with their infants. Evaluation will be made of materials for cognitive stimulation, teaching practices of mothers, and instruments for infant testing.

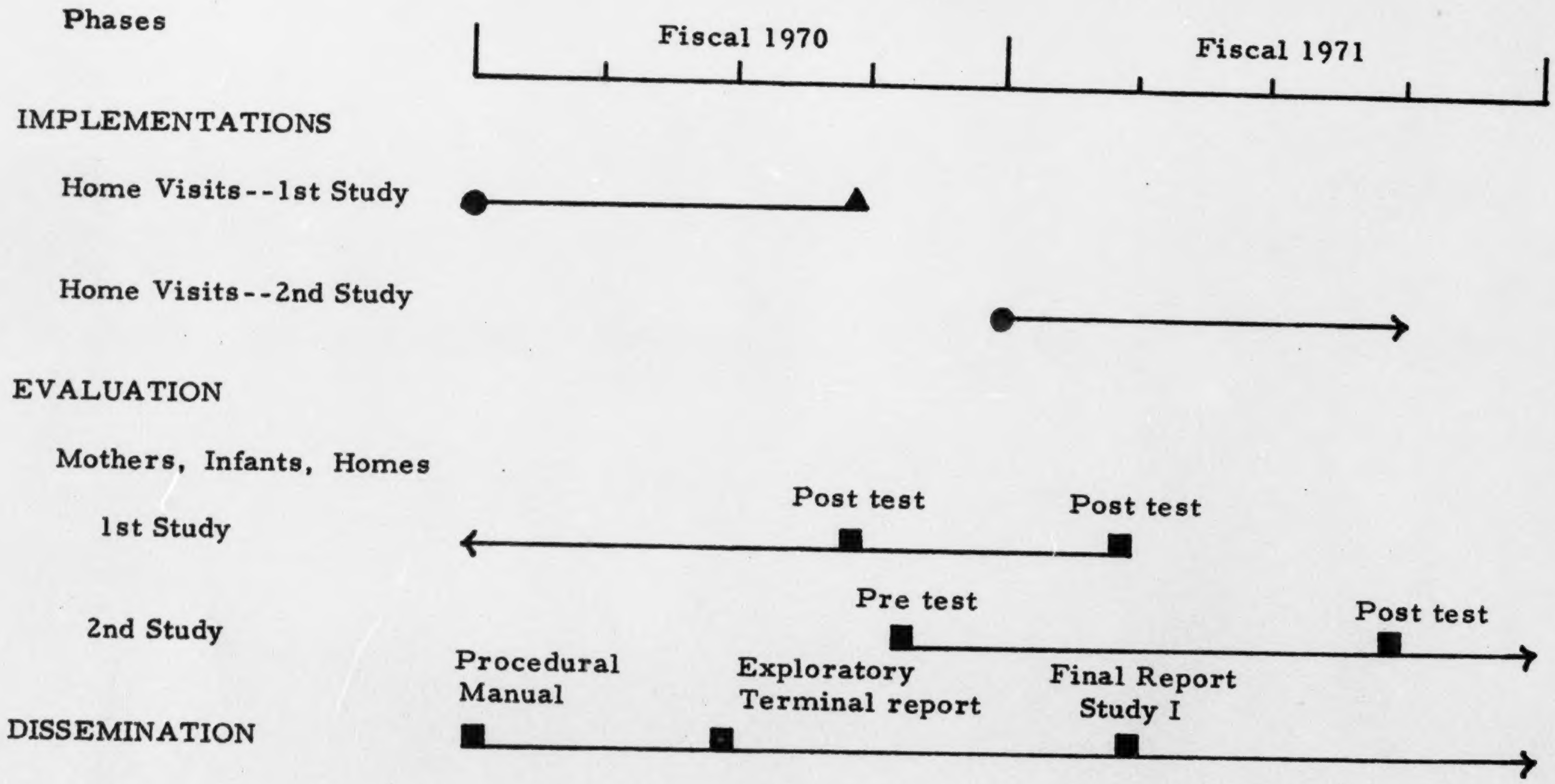
Importance, need, or justification: Cognitive input during the first year of life is vital environmental stimulation. The cognitive environment is provided for the infant through the mother. Programatic research should select cogent knowledge and experience for application in low-income homes by mothers who otherwise would not provide maximum, efficient, or effective cognitive input for their infant. Assessment must be made of the mother's role in early intervention research, and implications for general applicability of a model must be derived. Techniques used with mothers of preschool children in the Vertical Diffusion Study and additional techniques developed in the Infant Exploratory Study will be employed. In this study the role of the home visitor who serves as an educational change agent will be described. The Ecological Studies Program will provide basic input for the mother-child interaction focus and the home educational environment emphasis. Tests for infant evaluation are related to the Center's interest in appropriate assessment instruments.

Characteristics of sample and users: Sample: Subjects during the first year will be twenty young white and Negro mothers from low-income homes and their infants who are between six and nine months of age at the beginning of intervention. During the second year, infants with one or more siblings under age four will be selected.

Characteristics of sample and users (continued)	Users: Parent educators, home teachers, professionals, and paraprofessionals in Parent-Child Centers, and personnel of other child care agencies are groups to whom information will be disseminated.
Method, strategy, or design:	Mothers and infants will be selected, recruited, and tested. A home visitor will work directly in the home with the mothers, each week, for one hour per visit, for a period of nine months. Materials appropriate for cognitive stimulation will be introduced and demonstrated. Mothers will be taught essential stimulating skills and ways of programming stimulation. Weekly exercises will be assigned Edquipment with stimulus and response potentials will be provided for autotelic activity or self-produced stimulation by the infant. The responsive environment approach will involve physical features of things and social behavior of persons in relationship to the infant.
Evaluation procedures:	Project staff will have weekly meetings to discuss progress, problems, and prospects. The treatment programs for mother-infant dyads will be planned--evaluated--and revised. Objective measures for the homes, mothers, and infants are contingent on the evaluation of assessment instruments that will be made during the Infant Exploratory Study. The homes will be rated with a home observation guide or a home stimulation inventory. Maternal cognitive development, cognitive style, and language style are criterion variables to be evaluated. Tentative instruments selected for the assessment of infant abilities and psychological development are the Griffith Scales, the Uzgiris-Hunt Scale, and the Bayley Scales. All subjects will be pre-tested and given follow-up tests nine months and fifteen months after implementation.
Expected end products of results:	This study should provide an evaluation of the efficacy of a home intervention program for mothers of infants, and an assessment of maternal teaching practices. Products should include a procedural manual, a responsive environmental crib apparatus, and materials recommended for cognitive stimulation.

Resources: A principal investigator, two home visitors, an infant examiner, a materials specialist, and part-time examiners for testing of mothers and home observation, are minimum human resources. Materials will be developed--designed or devised--which will provide appropriate stimulation at minimum cost per family.

Project: Intervention Study with Mothers and Infants



P-BH

Title: Major Intervention Study: Contrast of Two Differential Treatments of Mothers

Principal Staff: S. W. Gray, B. Gilmer, S. Cook (Univ. of Colo.), K. Olley, M. Sweeney

Purpose, objective, or goals: This study is multi-faceted with a cluster of related or congruent purposes:

1. To provide, on an eight-hour basis, a demonstration facility where our general approach to programming for children and their mothers is practiced.

2. To provide a training facility for graduate students.

3. To provide occasion for further development and testing of our curricular approach to four-year-old children (the bulk of our developmental activities have been with five-year-olds).

4. To provide a testing situation for instruments to be developed during the year to assess certain aspects of our intervention techniques--particularly concept development of independence and internal control.

5. To contrast two ways of working with mothers of children in intervention programs--one that of passive, somewhat non-structured, involvement (the usual PTA-like approach) versus a programmed series of learning activities in which the mother becomes actively engaged in and takes partial responsibility for the ongoing program for children. Of particular interest here will be attitude change in mothers as related to race and type of involvement.

6. To provide a setting where certain short-term research by graduate students is possible.

7. To enhance the employability of the mother's active involvement group.

Importance, need, or justification:

Objectives one and two are of concern because of our continuing need to demonstrate to large numbers of visitors and to train students in those ways which we currently find most effective with the kinds of populations we serve. With students, we believe it critical that they be well-practiced in an approach and also able to develop a respect for empirical data, if they are to be in the forefront of early education. Objective four, we feel, is a major need for all kinds of early childhood programs today, and we wish to focus our assessment efforts this year on two major aspects only of our program, in the hopes that such concentration may enable us, in the year's span, to develop instruments that, at least in a far-along experimental stage are useful. Objective five is related to the major problems continually encountered in racism, especially among low income and working class whites. The success of George Wallace in the last presidential election is suggestive of the significance of white racism. The justification of objectives three and six would appear obvious.

Internal: This project is a logical development and extension of the study of vertical diffusion. It will draw upon the Ecological program and the program on Individual Characteristics for some shaping of the curricula for children and their mothers. It will utilize the skills developed in the home visitor approaches of the study of Vertical Diffusion and the Head Start Home Visitor, as well as the study of Mother Home Visitors. It obviously relates to the dissemination program and the training program.

External: Although this study is directed toward younger groups, there will be certain points of commonality with the Arizona intervention studies and with their study of parents as instructional aids. The Chicago studies of maternal teaching style initiated under Shipman have suggested variables for manipulation with the group of mothers. The Cornell study of

Importance, need, or justification (continued)

maternal teaching strategies also intersects with this study. We are hopeful that the assessment aspects of this study and the Syracuse study of assessing preschool behavior may share in approaches and findings.

Method, strategy, or design:

The study is currently planned on a replication design. During the first year, two groups of ten children and their mothers will be involved in the study, ten pairs in one daily session for forty weeks, and ten pairs in another similar daily session. There will be a third group of mother-child pairs as a comparison non-treatment group. For the mothers, there will be the two treatments mentioned under Objective five. The active involvement group will be patterned after the maximum impact group of the study on Vertical Diffusion of Treatment Effect, with somewhat heavier emphasis than formerly on the mother's active involvement in program planning and evaluation of daily sessions. There will be two to four part-time supervisors for the mother group, equally divided as to race. The mothers themselves will be divided into four groups of five each, two or three blacks and two or three whites. The groups of children, which will vary in number from four to six also will be divided approximately as to race. The program for the passive group of mothers will consist of lectures on relevant topics, appropriate films, and demonstrations.

During the second year, if funding is available, the plan is to double the size, so that forty mother-child pairs will be involved in the total study. Thus, over the two years fifteen white mother-child pairs will be involved in the active involvement, and fifteen white mother-child pairs in the passive involvement. Similar numbers of black mother-child pairs will be involved.

Characteristics of the users:

Eighty urban low income mothers and their children aged 3.11 to 4.11 at start of study; forty of these will be white and forty black.

Evaluation:

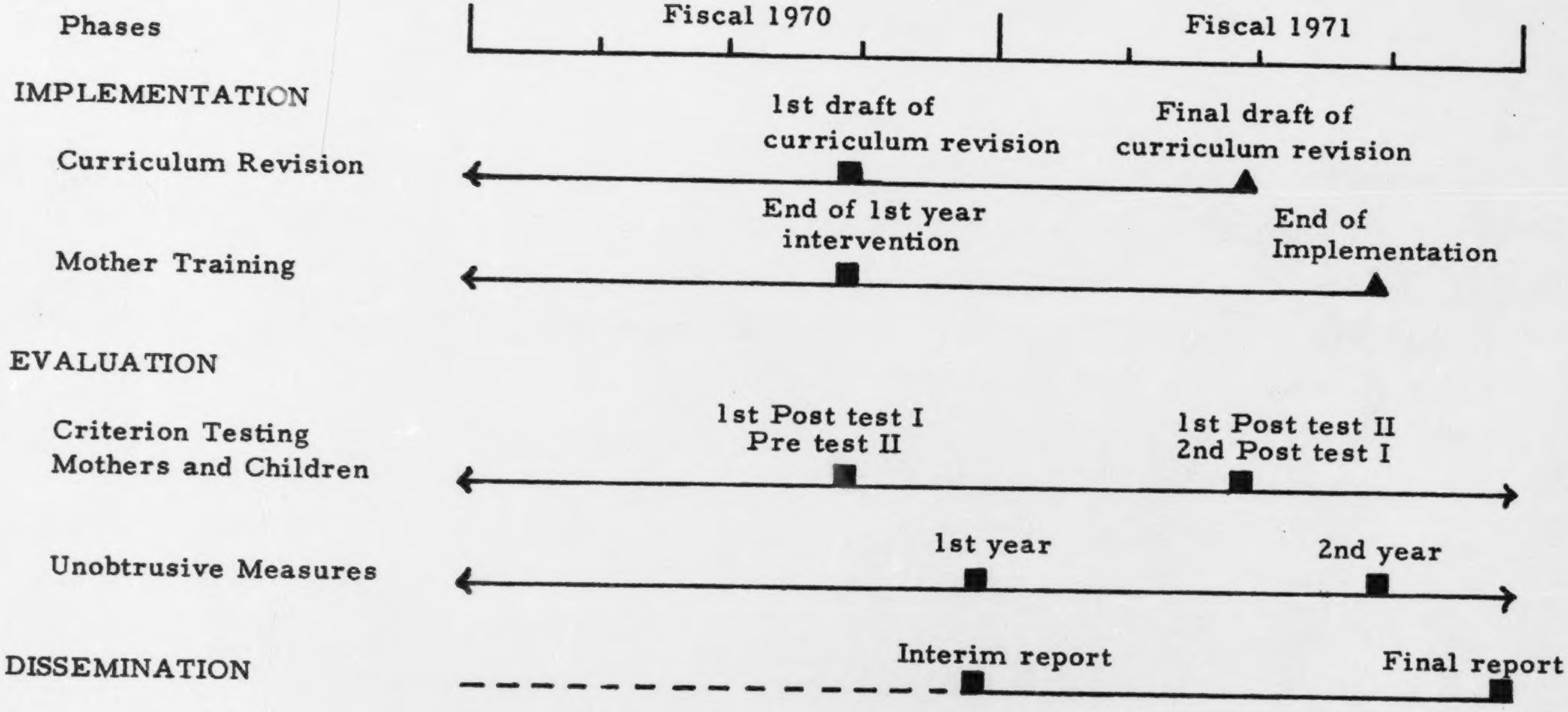
For mothers: Baseline data will include the WAIS, a test of language-telling stories related to three pictures, a home observation scale of spatial and temporal order in the home, and a test of teaching style with children. Racial attitudes will also be assessed. (The racial attitude aspects of this study will be handled on a separate funding basis (not OE) by Dr. Stuart Cook of the University of Colorado.)

For children: Pre- and post-test measures will be: (a) Binet; (b) Gilmer concept test. Additional post-measures will be used, comparing the two treatment and the one non-treatment groups. Presently it is planned (see Program on Supportive Activities) to direct especial effort toward developing a more adequate test of concept formation as one moves from age four to ages five and six (the Gilmer test is more directed toward four-year-olds) and to attempting to develop methods of assessment of independence. It is anticipated that these will be ready in experimental form at the end of the forty weeks of treatment.

Expected end products of results:

Publications of this study and its findings in professional and lay journals, general dissemination materials on the study, such as video tapes, contribution toward assessment and validation of our general approaches to intervention for four-year-olds.

Project: Major Intervention Study


Phases
Fiscal 1970
Fiscal 1971
IMPLEMENTATION
Curriculum Revision
1st draft of curriculum revision
Final draft of curriculum revision
Mother Training
End of 1st year intervention
End of Implementation
EVALUATION
Criterion Testing Mothers and Children
1st Post test I
Pre test II
1st Post test II
2nd Post test I
Unobtrusive Measures
1st year
2nd year
DISSEMINATION
Interim report
Final report

Title: The Vanderbilt-DARCEE Research Project On Nutrition And Learning

Principal Staff: DARCEE Staff: S. W. Gray, B. Gilmer; Division of Nutrition, Vanderbilt University School of Medicine; Department of Dietetics, Vanderbilt University Hospital; Meharry Dental College; J. P. Carter, H. H. Sandstead, W. J. Darby, F. House, and K. Massey.

Purpose, objective, or goals: Although improving the educability of young children from varied low income environments is hardly the whole solution to the problem of poverty, it is a necessary component of any solution that would have impact within a generation.

By the same token, malnutrition, which occurs in utero or during the first six months of life, has been shown to reduce the number of brain cells produced by anywhere from 20 to 40 percent of normal. Furthermore, individuals who are malnourished during the first two years of life show subsequent retardation in growth, development, and maturation resulting ultimately in short stature, and a delayed onset of puberty. It is as if they have been programmed for their subsequent growth, development, and maturation.

Quite naturally and logically, there should be a nutrition component at DARCEE. With this in mind, the Division of Nutrition at Vanderbilt has agreed to a plan to examine the DARCEE children. A dietary study will be done. Dental, clinical, nutritional, and general physical examinations will be performed. Anthropometric measurements, including subcutaneous fat, height, weight, X-rays of bone and teeth development will be recorded. Biochemical parameters of nutritional status will be studied in both blood and urine.

Finally, both DARCEE and the Division of Nutrition at Vanderbilt have a major commitment to intervention work, where the accumulative research findings are

Purpose, objective, or goals (continued)

packaged and applied in a controlled field setting. We plan to correct any specific nutritional deficiencies by modification of the school lunch program to see whether this has any effect on the child's subsequent performance. The specific methods employed will be:

(1) To determine the daily dietary intakes of specific nutrients of the children participating in the DARCEE program.
(2) To determine by anthropometric measurements, including arm circumference and measurements of subcutaneous fat the developmental status of the DARCEE children.
(3) To assess the overall dental status of these children and determine tooth eruption.
(4) To determine bone growth by taking x-rays of the hand and lateral skull.
(5) To determine the clinical, nutritional and health status of these children by physical examinations.
(6) To measure visual acuity and hearing ability.
(7) To determine subclinical nutritional state by performing biochemical tests on blood and urine.
(8) To look for the presence of intestinal parasites by means of stool examination.
(9) To look at the child's total health picture in relation to his performance.
(10) To determine what role, if any, nutritional deficiencies play in determining a child's educability and performance.
(11) To study the child's meal pattern to see if the sensation of hunger interferes with the learning process by shortening attention span.
(12) To intervene by means of an improved or fortified school lunch to correct specific nutritional deficiencies to determine whether this measure by itself can result in improved performance.

Importance, need, or justification:

The information obtained about a child's nutritional status will then be put into context with characteristics of the children which include a series of cognitive style, character development, concept formation, and visual and auditory attending behavior. We hope to be able to

Importance, need, or justification (continued)

form some judgement from this as to whether nutrition influences the educability of young children from low income environments. In addition to the evaluation of nutritional status, meal patterns and the sensation of hunger will be studied in relationship to attention span and the learning process.

In addition to assaying the nutritional relationship with learning patterns, a second area will involve collection of data with respect to the Autonomic Nervous System functioning of preschool children. One hypothesis projected is that the general effects of a deprived environment may have an adverse effect upon the ANS functioning of the young child.

It is conceivable that malnutrition could effect cognitive performance by interferring with the CNS development. Intersensory organization could be effected by the modification of growth and biochemical maturation of the brain. The lack of responsiveness to the environment decreases the opportunity to learn. If this occurs during a time of normal sequential acquisition and integration of experience for the individual, learning could well be effected. The continuing effects upon the motivation to learn may be adversely effected due to the more apathetic condition of the child whose state of health is poor. The complexity of the functioning of certain reflex actions, intersensory development, and dulled attention will be explored as related to the lack of attainment and inadequate sustainment of preschool educational exposure.

Characteristics of sample:

During the first year, twenty rural (Fairview, Tennessee) five-year-old children from low income homes will be studied. Twenty urban (east Nashville) pairs, i.e. mother and child, will be involved for some forty weeks in an intervention program. The same time involvement is projected for the second year, 1970-71, when 40 mother-child pairs will constitute the program population. There will be a third group of mother-child pairs as a comparison non-treatment group.

Evaluation procedures:

The dietary data will be obtained by interviewing the mothers in the homes using the 24-hour recall technique. On a subsample of six children randomly selected, three day composite samples will be collected for direct analysis of nutrients by the Wisconsin Alumni Research Foundation. On a second subsample of six, seven day food inventories will be kept by the mothers. The following anthropometric measurements will be done.

1. Height will be recorded on all children. A portable stand-up height bar with a sliding rule is being made for this purpose.
2. X-rays of the L hand and lateral skull will be done and will be used to assess dental and bone growth. The hand x-rays will be read by the Fels Research Institute.
3. In addition, skin-fold thickness will be measured, using the Lange calipers, at two different sites, i. e. midtriceps and the angle of the scapula.
4. Mid-arm circumference will also be recorded.
5. Head circumference and chest circumference will be recorded.
6. The heights of the mothers and fathers (when available) will be recorded. The heights of the children will be correlated with the heights of one or both parents.
7. Birth weights of the children and previous measurements on the children will be obtained from local hospitals and health centers when available.

A dental survey will be done using the techniques developed by Russell to determine oral hygiene, the numbers of decayed, missing, and filled teeth, and the presence or absence and degree of periodontal disease. Tooth eruption and growth and development of the cranial and facial bones will also be assessed.

Evaluation procedures (continued)

Physical examinations will be done, looking for signs of nutritional deficiencies. In addition the children will be examined from the standpoint of detecting medical problems which may necessitate referral for treatment. This portion of the examination will include a test of visual acuity, and audiogram, examination of the eyes for strabismus, examination of the throat, heart, lungs, abdomen, genitalia, and neuromuscular system.

The clinical nutritional examination will be similar to the one used on the National Nutrition Survey, which is being conducted by the National Center for Chronic Disease Control, USPHS. This type of examination has been previously used by the Nutrition Division at Vanderbilt in nutrition surveys in this country and abroad. Our clinical findings should be comparable to those obtained from other parts of the country and the world.

The biochemical parameters to be determined include hemoglobin using the cyanmethemoglobin method. Serum vitamin C levels will be determined by using the dinitrophenyl-hydrazine method. Total protein will be determined by the standard biuret method. Electrophoretic patterns will be done using a cellulose acetate membrane and a Beckman micro electrophoresis machine.

Vitamin A and serum carotene will be determined by the micro trifluoroacetic acid method. Serum iron and total iron binding capacity will be determined by the Ramsey method. Serum folate and red blood cell folate will be determined by microbiological assay. Alkaline phosphatase will be determined by the King Armstrong method. Transketolase and thiamine pyrophosphate effect will be determined as outlined by Brin.

Urinary iodine levels will be determined using a modification of Zak's procedure and the values obtained will be related to creatinine excretion. Hydroxyproline/creatinine ratios will be determined as outlined by Whitehead.

Evaluation procedures (continued)

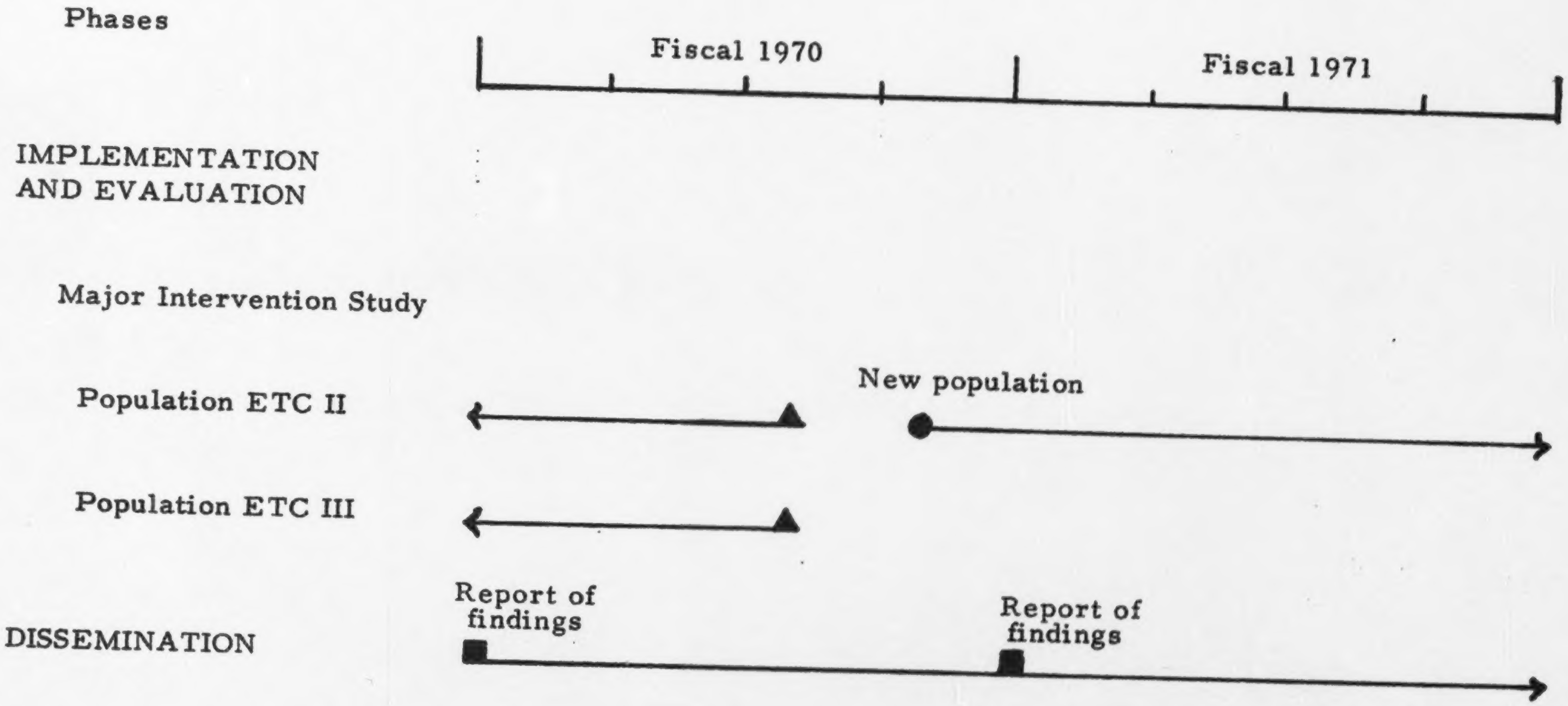
Stool examinations will be done for ova and parasites using the direct smear technique and a modified zinc sulfate flotation method.

The information obtained about a child's nutritional status will then be put into context with the cognitive and behavioral data collected on the children and their families while in the DARCEE program. Along with this, the physiological measures obtained will be studied as related to the preschool child's learning both prior to and after modification of the dietary intake.

Expected end products of results:

Information on the physical and behavioral correlates as related to learning in the preschool child will be disseminated in monograph form as well as appropriate journal publications.

Project: The Vanderbilt-DARCEE Research Project of Nutrition and Learning



Title: Ecological Studies

Principal Staff: P. Schoggen, M. Schoggen, E. Brown, J. Poole

Purpose, objective, or goals: The principal objective for the next two years will be an effort to relate the findings from the ecologically oriented work to the findings of others working within different theoretical frameworks in an effort to:

(1) use the ecological data gathered in the last three years to its maximum potential, and;

(2) to attempt to pull together from a variety of sources as much information as possible about the characteristics of preschool children in different socioeconomic-geographic groups and their environments.

Importance, need, or justification: Intervention procedures have been based on differences among children revealed through tests and assumed differences in environments which are relatively undefined. Most current studies on mother-child interaction patterns are based on measures in contrived situations; little is known about normal mother-child interaction in the home. Sibling-child interaction in the home has been largely ignored. The detailed analysis of units previously identified in specimen records from the sample described below will provide data for comparing the social environment and behavior of children in the three population sub-groups.

The comparison of these results with the results of others should yield a rich fund of information which should prove helpful in understanding the meaning of certain child rearing practices, provide a basis for future research and possibly suggest directions for future intervention.

Characteristics of sample: (a) Characteristics of the target samples. Specimen records have been made of three-year-old children in low income, low education urban homes, low income, low education rural homes, and upper income, high

Characteristics of sample (continued)

education urban homes. The records range in length from 10 to 47 minutes; the average length is 28 minutes. Half of the two urban samples are black families, half are white. Males and females are equally represented in each sub-group. Large and small families are represented in the sample.

(b) Characteristics of the users: The library of 196 specimen records of three-year-old behavior at home represents the most extensive collection now available of basic data in natural situations on one age group. These records should be made assessible to people with a wide range of interests; e. g., persons interested in child development, per se; those interested in basic reinforcement principles; educators, particularly those in intervention programs; or persons trying to teach mothers better child care.

Method, strategy, or design:

(1) Initial steps of analysis, i.e., processing of the specimen records into units of agents' behavior, called Environmental Force Units, and units of child behavior, Episodes, will be completed by December, 1969. Methods for further analyses of these units are available from earlier ecological research. Each Environmental Force Unit will be analyzed according to a behavior coding system devised by Phil Schoggen. The goals of agents in the child's environment and the methods used by the agent to implement each goal will be categorized separately and in addition to the content analysis of the behavior coding system.

(2) Methods used by others, e. g., Hess and Shipman, Bettye Caldwell, Alfred and Clara Baldwin, will be used on a pilot basis to determine the feasibility of analyzing specimen records via analyses within foci different from the ecologically oriented analyses.

(3) New analytical procedures will be developed for particular kinds of analyses derived from certain

Method, strategy, or design (continued)

theoretical positions toward problems of great current interest. These procedures will explore the possibility of, for example, (a) identifying and categorizing reinforcement techniques by agents in the home; (b) determining moral values taught to the child by agents as indicated by their behavior to the child and by the child's own behavior; and (c) identifying patterns of curriculum in the home as presented by agents.

It would be desirable to proceed first with (1), and then to do pilot work with (2) and (3) so that the most fruitful lead could be followed in greatest depth.

Evaluation procedures:

Currently critical evaluation of progress in this area appears necessary, and it would not be feasible to procede with a part of the program should initial work suggest the part was not a fruitful approach. On the other hand integrative approaches are sorely needed to try to bring together related research and results. Phil Schoggen will have the major deciding role on which phases to stress and which to discontinue.

Expected end products of results:

From the analyses of behavior categories, agent methods, and agent goals, a more complete description of home environments of our sample will enable us to identify similarities and differences across the population sub-groups of the sample. These results will be compared with the findings from other studies in the field.

A guide for delineating Environmental Force Units and for Coding Behavior of Agents in the Environment will be revised and prepared for distribution.

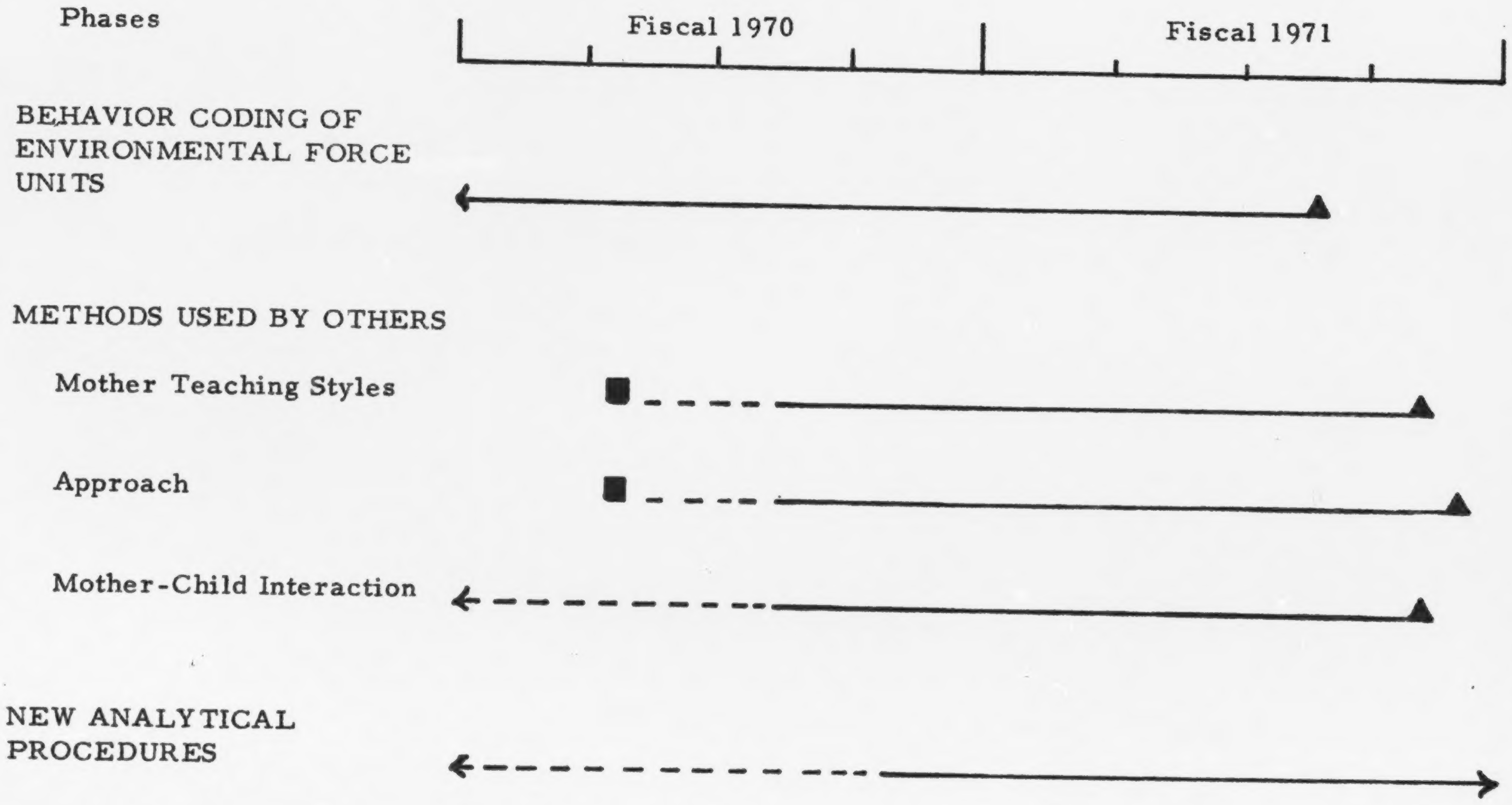
Articles will be prepared and submitted to appropriate journals.

The pilot studies of procedures will be assessed to determine potential for collaborative work with others working in the area of mother-child interaction analyses.

Program Time Schedule:

See attached Flow Chart.

PROGRAM: Ecological Studies



Title: Basic Child Studies

Principal Staff: C. Mumbauer, J. Aldous

Purpose, objective, or goals: To increase understanding of the development of cognitive and social functioning in young children, particularly young, disadvantaged children.

Importance, need, or justification: Presently, research information about the early developmental characteristics of cognitive processes, achievement motivation, and relative potencies of various reinforcers for young children is meager. There is evidence that a number of subject and situational variables such as socio-economic background are relevant to the development and manifestation of these processes. Since the important role of these processes in determining such behavior as a classroom functioning has been recognized, obtaining further understanding and knowledge of them is imperative. Such information is a necessary part of the foundation for the educational process and its improvement.

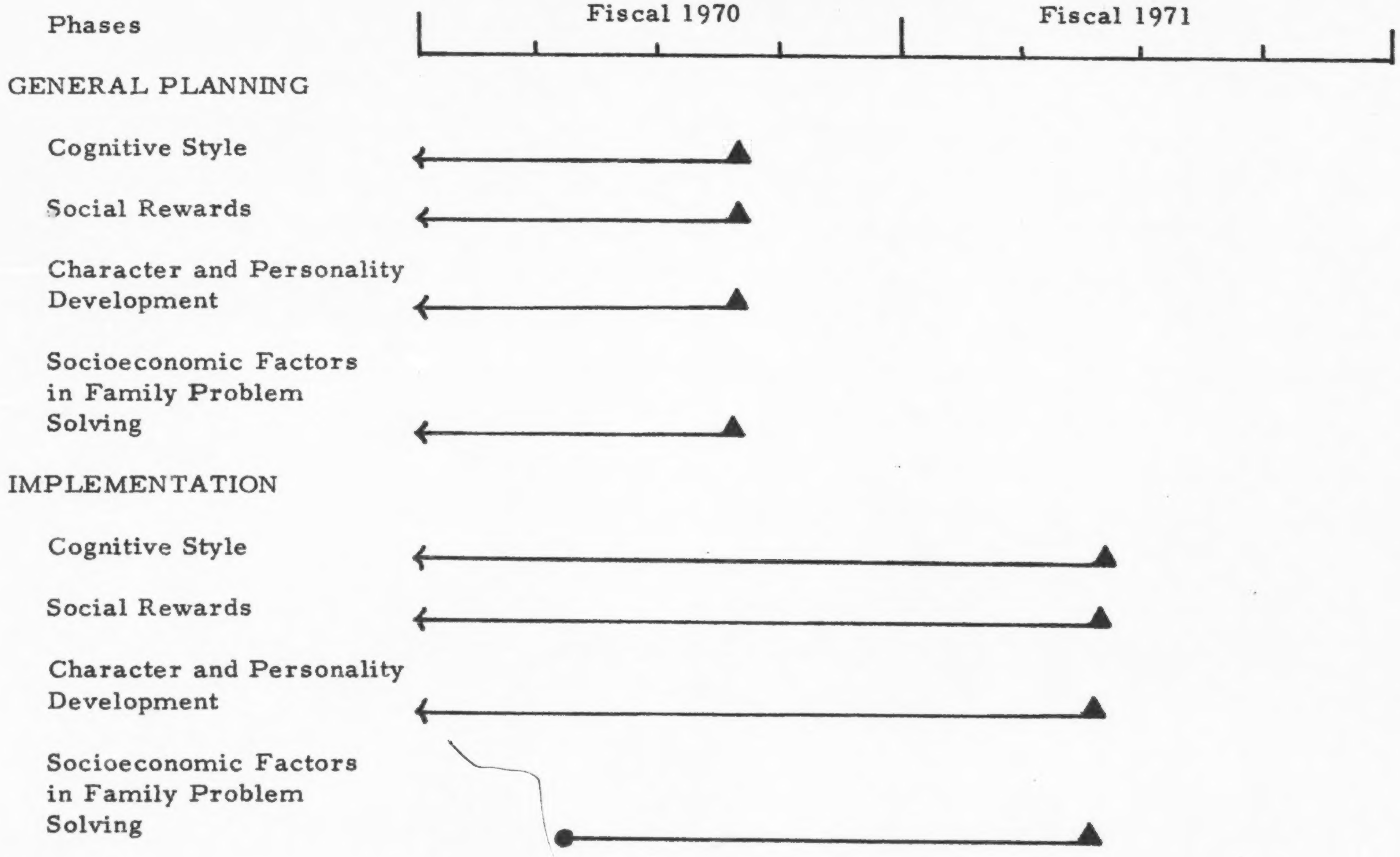
Characteristics of users: Children used as subjects in the research projects of the individual characteristics program will range in age from early childhood, or age four or five years, to middle or late childhood. Interest in relative performance of children from various socioeconomic backgrounds will require both advantaged and disadvantaged children be included in the sample.

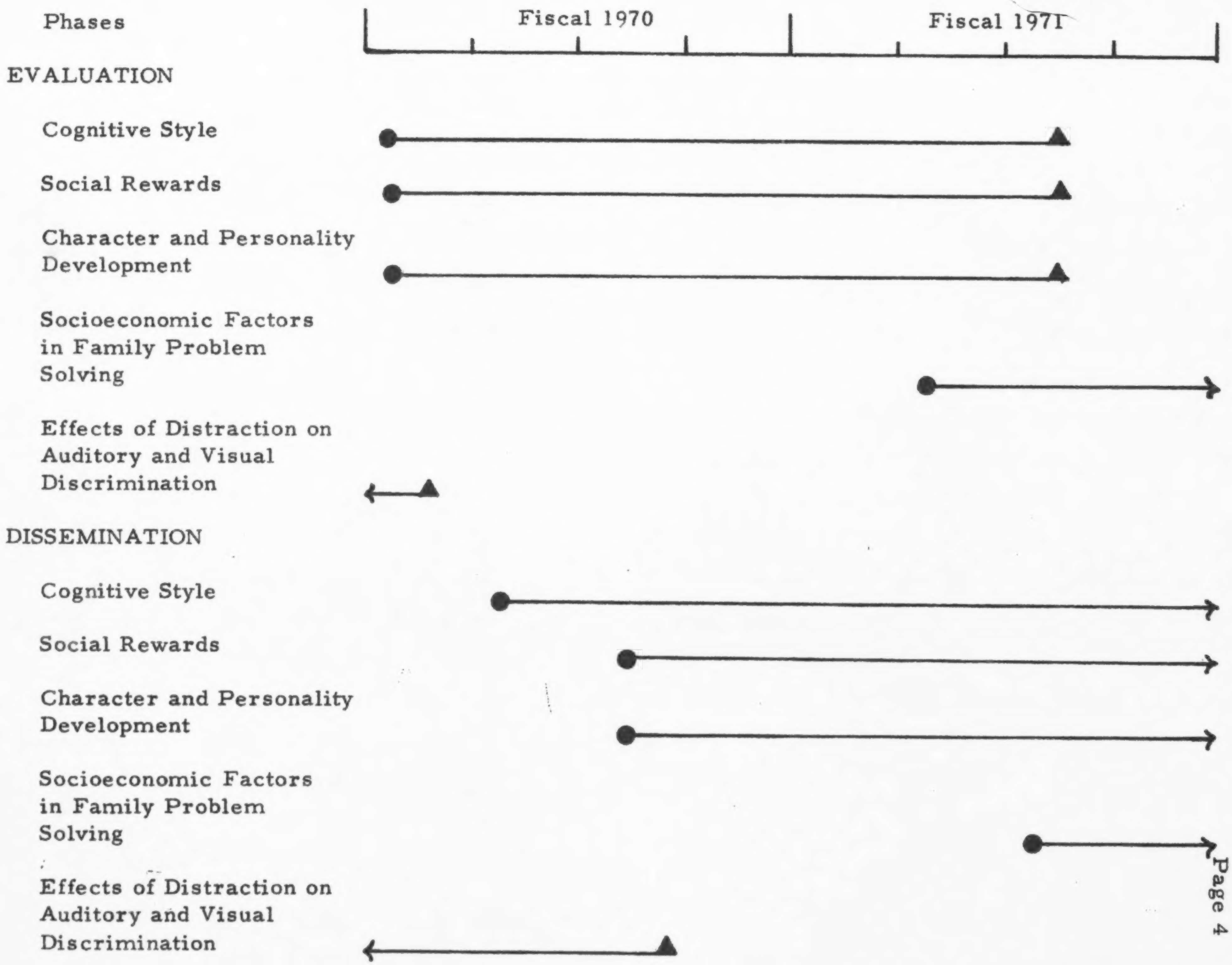
Method, strategy, or design: Especially designed tasks administered under varying experimental conditions will be used to assess performance of children who vary in terms of socioeconomic background, rural versus urban residence, age, and sex. Results of initial studies will be used by the project head to plan the later studies undertaken in the program.

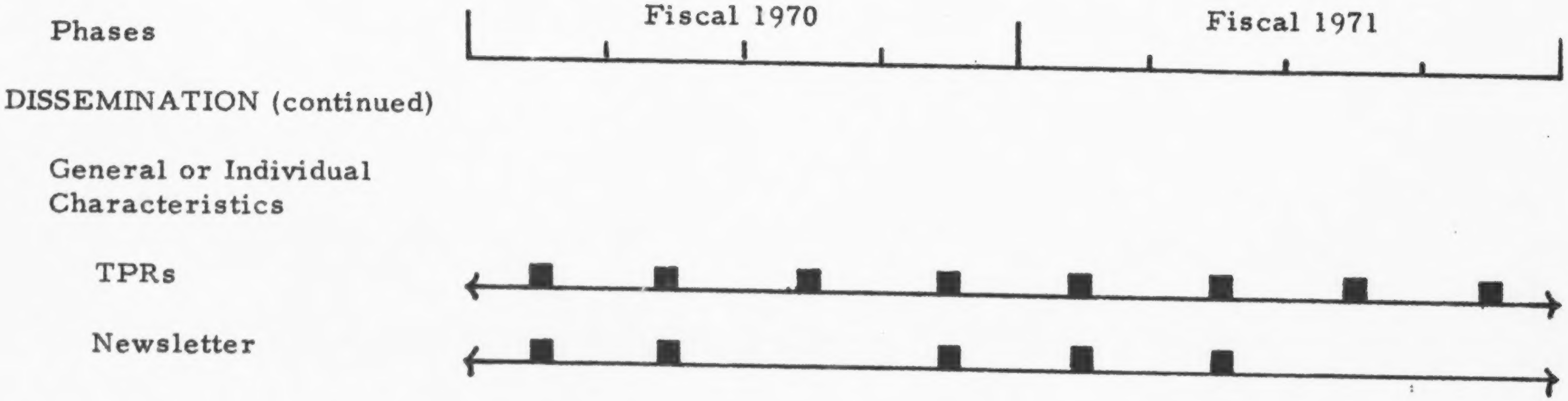
Evaluation procedures: Evaluation of the measures designed for the projects in this program are an intrinsic part of the research process. All data is necessarily evaluated with standard statistical procedures.

Expected end products of results:	This program should result in a significant increase in understanding of the developmental characteristics of basic psychological processes. Additional knowledge about the cognitive and personality processes studied should enable more efficient educational and intervention projects to be designed.

PROGRAM: Basic Child Studies




Phases
Fiscal 1970
Fiscal 1971
EVALUATION
Cognitive Style
Social Rewards
Character and Personality Development
Socioeconomic Factors in Family Problem Solving
Effects of Distraction on Auditory and Visual Discrimination
DISSEMINATION
Cognitive Style
Social Rewards
Character and Personality Development
Socioeconomic Factors in Family Problem Solving
Effects of Distraction on Auditory and Visual Discrimination


Phases
Fiscal 1970
Fiscal 1971
DISSEMINATION (continued)
General or Individual Characteristics
TPRs
Newsletter

P-DB

Title: Cognitive Style - Processes of Cognitive Style

Principal Staff: C. Mumbauer

Purpose, objective, or goals: To increase understanding of the processes involved in determining a child's cognitive style.

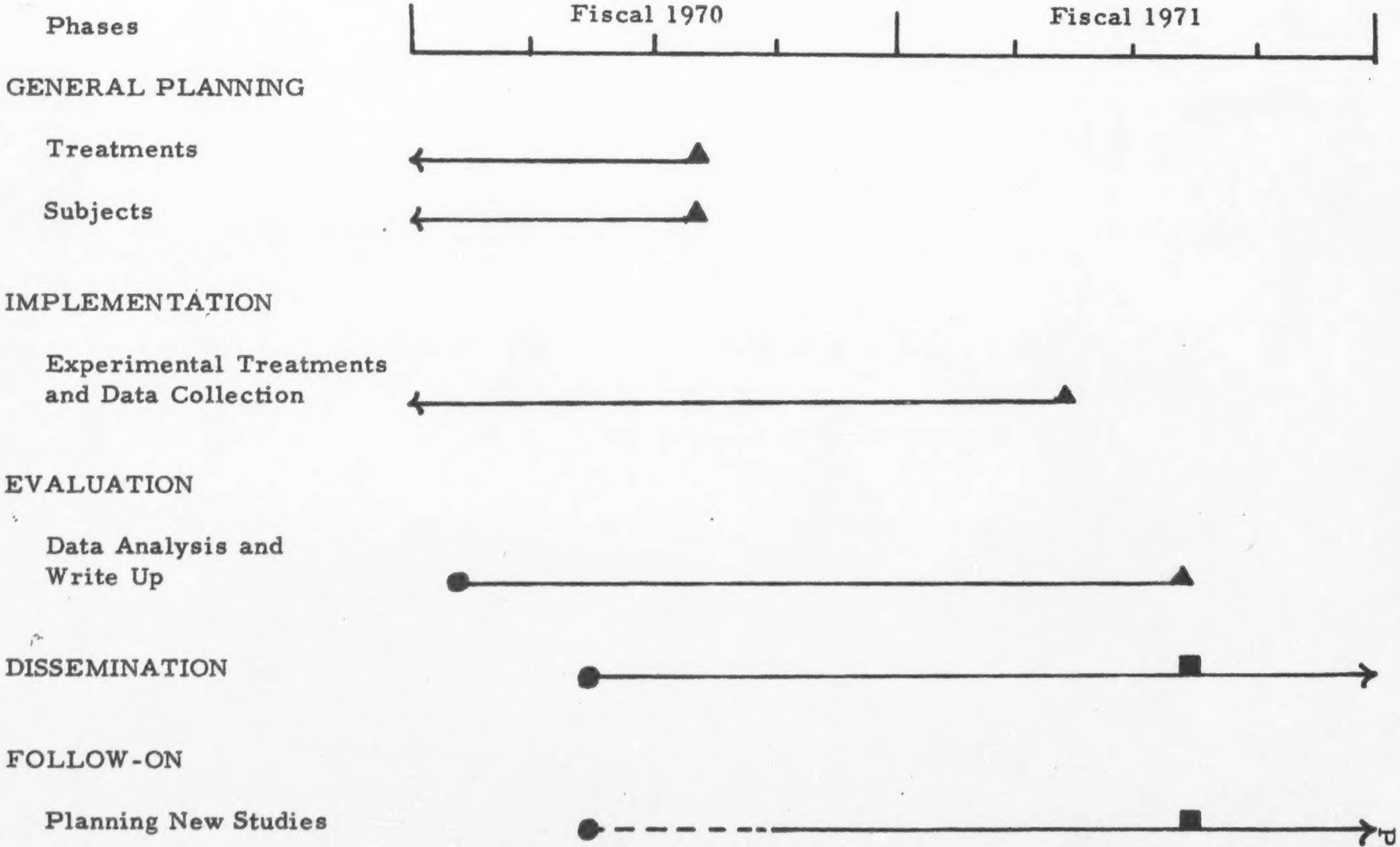
Importance, need, or justification: Previous research has suggested that children vary in cognitive style. There is some suggestion that the more reflective child is more likely to be successful in various other cognitive tasks. Additional findings suggest that disadvantaged children are more impulsive than their advantaged counterparts. Such findings add to the importance of understanding cognitive style as a dimension of children's cognitive development. The research proposed here should add to the understanding of the processes involved in this response dimension.

Characteristics of sample: Fourth grade boys and girls from advantaged and disadvantaged backgrounds will be the focus of this investigation. The advantaged-disadvantaged variable will continue to be explored in the series of studies developed in this line of research. Of particular interest will be its relationship to changes in the cognitive style processes with age.

Method, strategy, or design: Fourth grade children from advantaged and disadvantaged backgrounds will be given a measure of cognitive style and then asked to perform a signal detection problem. Signal detection procedures permit separation of perceptual thresholds and level of certainty or criterion of certainty subjects establish before responding. It is the latter response variable upon which impulsive and reflective subjects are expected to vary, if variations in level of certainty before responding is one of the determinants of cognitive style. Based on the outcome of this research additional studies will be designed to investigate the conditions under which level of certainty changes and the changes with age in level of criterion set.

Evaluation procedures:	Evaluation of the influences of socioeconomic background in other subject and treatment variables in terms of the quantification of subject responses are an essential and intrinsic part of the research design. Standard statistical procedures, including analysis of variance and correlational techniques will be used to evaluate the results.
Expected end products of results:	Results from this study and those that follow are expected to increase understanding of the processes involved in cognitive style. Understanding such processes would facilitate training more adaptive cognitive styles, particularly in disadvantaged children. Therefore, findings from this study and the intended series of studies, should facilitate the development and design of more efficient education and intervention programs for the disadvantaged. Information gleaned will feed into classroom activities.

Project: Cognitive Style--Processes of Cognitive Style



P-DC

Title: Character And Personality Development

Principal Staff: C. Mumbauer, J. Lawson, M. Byrd

Purpose, objective, or goals: To increase the understanding of character and personality development or more specifically, persistence in young children. To increase understanding of the development of persistence in achievement oriented situations among disadvantaged children is of particular concern in this series of studies.

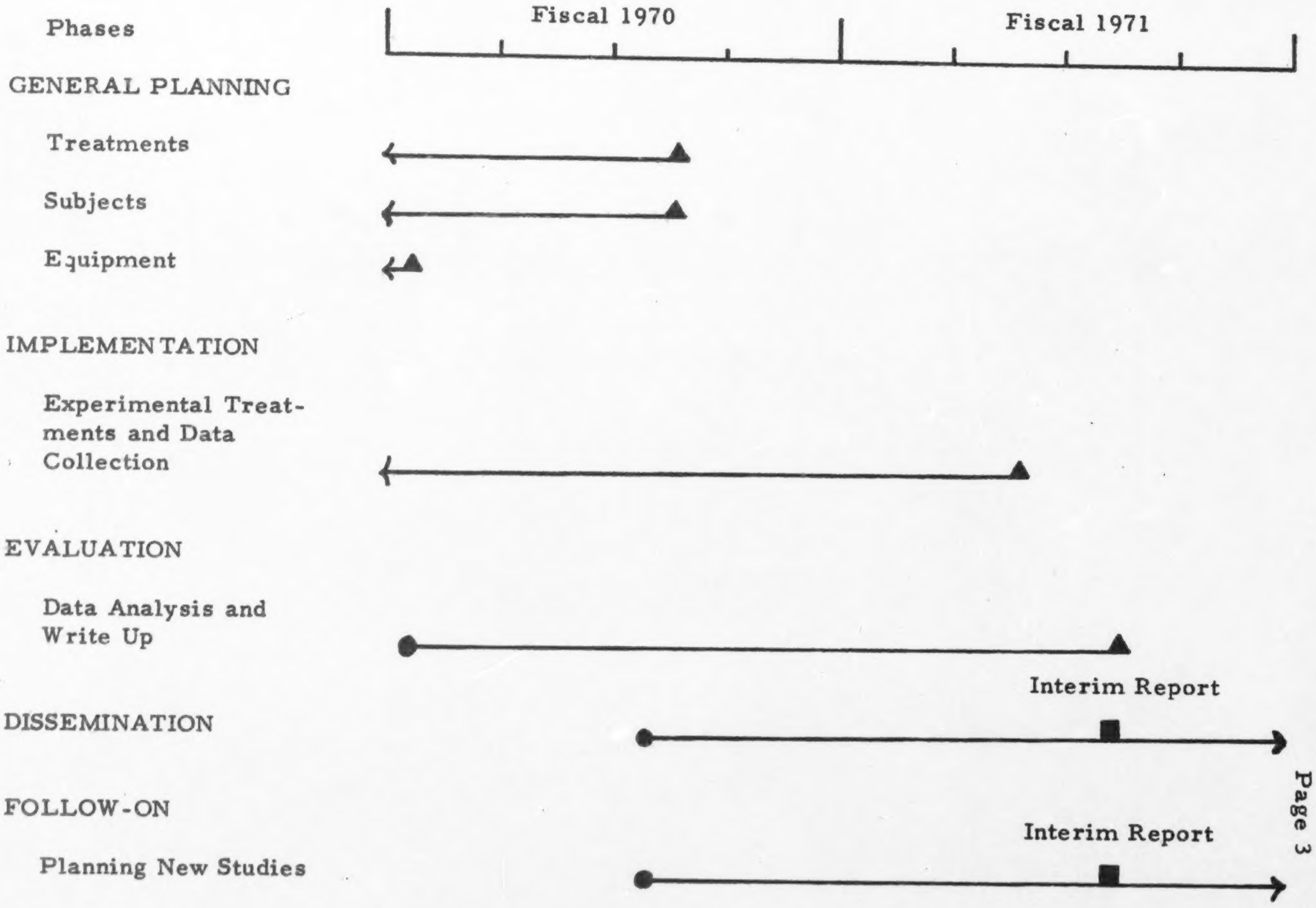
Importance, need or justification: This research is designed to add to the fund of basic knowledge about the child with an emphasis on the culturally disadvantaged child. Socioeconomic factors have been identified as playing a role in the motivational response tendencies of individuals. More information is needed about the development of persistence and other aspects of achievement motivation in individuals and across socioeconomic groups. Increasing basic knowledge about the development of such personality characteristics provides blocks in the foundation upon which more efficient education and intervention can be designed.

Characteristic of sample: Young children ranging in age from six to middle childhood and varying in socioeconomic backgrounds will be the focus of these investigations.

Method, strategy, or design: Both subject and experimental variables will be controlled and/or manipulated in these investigations. In the first of these studies, first and fifth grade children from advantaged and disadvantaged backgrounds will be compared in terms of their persistence under achievement oriented conditions. The effect of the possibility of attaining a concrete reward or the lack of such a possibility will also be ascertained. In the second study the performance of children from similar age and socioeconomic groups will be observed in a test-like situation under varied instructions as to the hardness or easiness of the task for their peers. The subsequent studies undertaken will be designed by the project head on the basis of the findings of the above research.

Evaluation procedures:	Measurement of children's responses and standard statistical analyses of the resulting data is an intrinsic part of the research procedure. Such statistical techniques as analyses of variance permit evaluation of the subject and situational variables examined in the studies.
Expected end products of results:	Results from these investigations of personality development should provide useful information about the way in which children develop along this dimension. This information should facilitate the development and design of more efficient education and change programs as well as evaluation of such programs.

Project: Character and Personality Development



P-DD

Title: Socioeconomic Factors In Family Problem Solving Behavior

Principal Staff: J. Aldous

Purpose, objective, or goals: To increase understanding of the role of socioeconomic factors in the problem solving behavior of family groups.

Importance, need, or justification: Among those families identified as low-income, or "poor", some appear better able to take advantage of opportunities to improve their situation than others. Little is known about the factors which contribute to the more effective problem solving these families exhibit. This research is designed to increase understanding of these factors and of the problem solving processes themselves. Products of the study facilitate identification of the more effective problem solving families who might be the most promising targets for intervention. In addition, further understanding of the problem solving process itself will facilitate communication of such skills to less adept family groups.

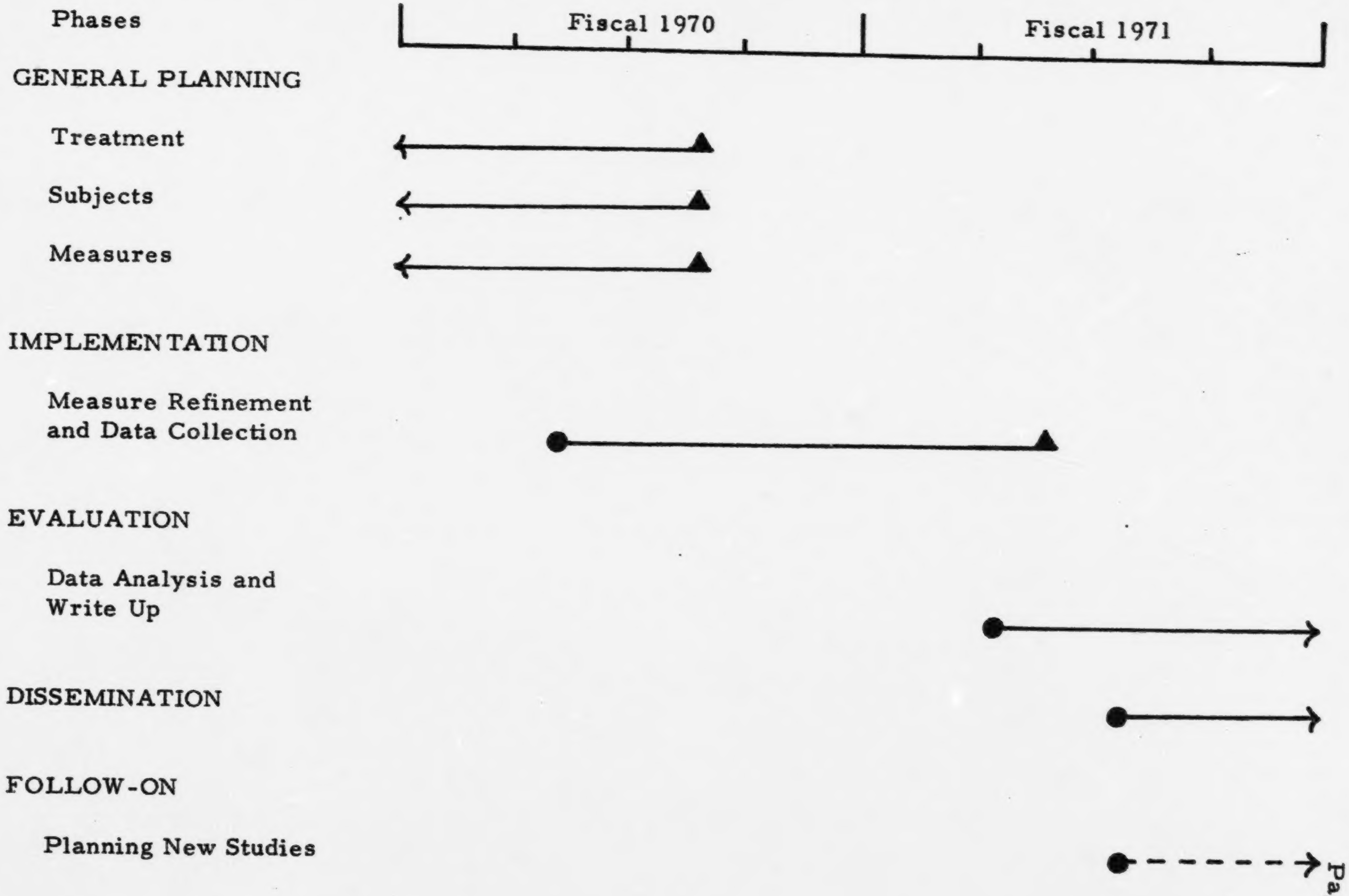
Characteristics of sample: White and black families from poverty and middle income levels will be selected for testing.

Method, strategy, or design: Measures will be devised to reflect problem solving behavior in husband-wife-child triads from low and middle income groups.

Evaluation procedures: As a part of the research process, standard statistical analyses will be applied to the data collected.

Expected end products of results: Information about the problem solving processes will be fed into the ongoing intervention projects. Publication in professional journals will disseminate findings to the broader professional audience.

Project: Socioeconomic Factors in Family Problem Solving Behavior

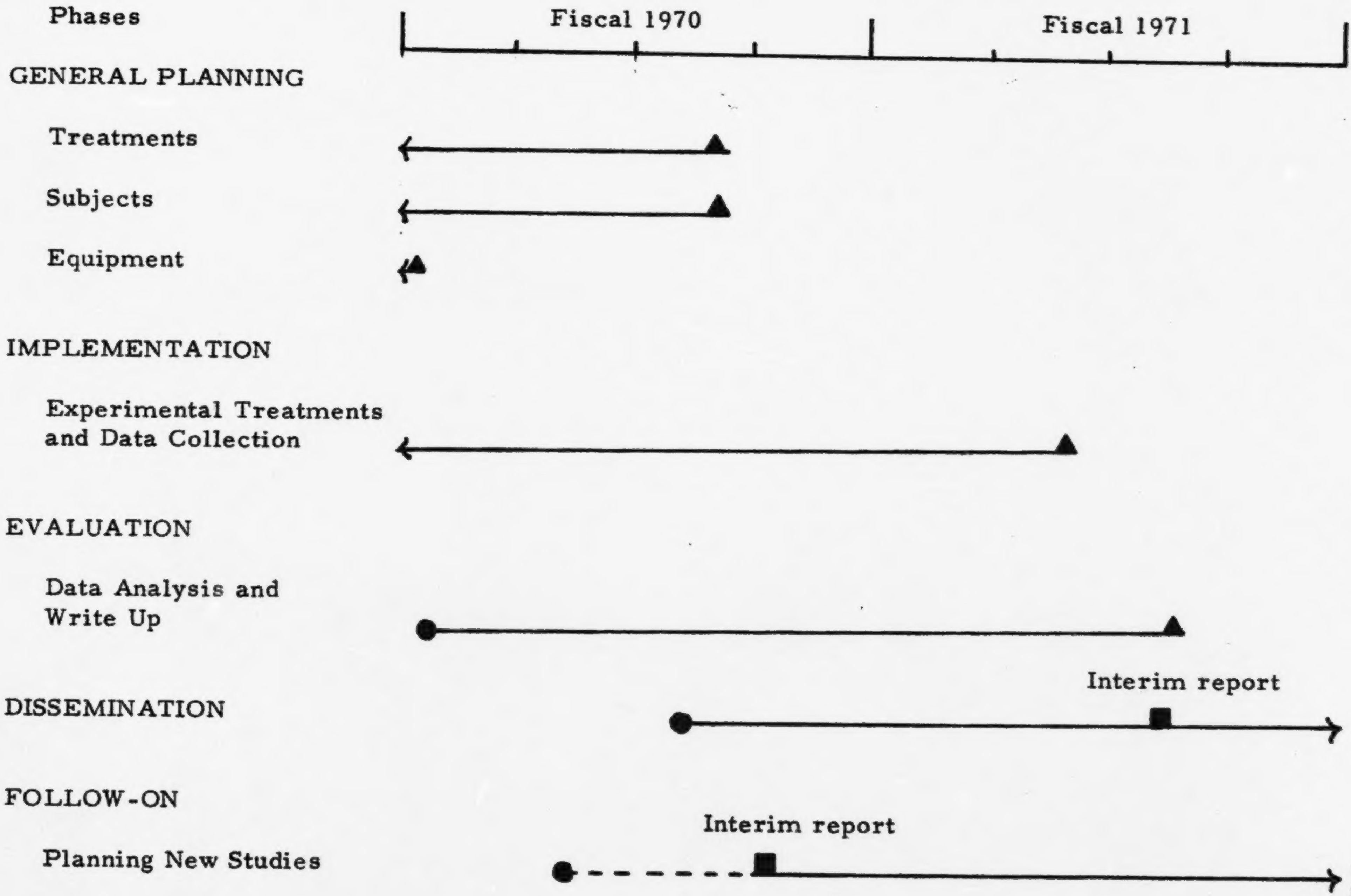


P-DE

Title:	Social Rewards as Reinforcers
Principal Staff:	C. Mumbauer, A. Mangles, J. Lawson
Purpose, objective, or goals:	To increase understanding of the potency of social and primary rewards as reinforcers for young children.
Importance, need, or justification:	Previous research on the relative potency of social and primary rewards as reinforcers for young children have been contradictory. Since it is important to find the most potent reinforcers for use in the intervention classroom, more information on the value of various rewards would be beneficial. This research is therefore designed to add basic information about the child, particularly the culturally disadvantaged child. In increasing this basic knowledge about the child and his development such research is providing blocks in the foundation upon which more efficient educational enrichment can be designed.
Characteristics of users:	Young children ranging in age from four to six and varying in socioeconomic backgrounds will be the focus of the first investigation. Disadvantaged children of the same age from rural and urban backgrounds will be the target of the second study. Similar populations will be the target of studies evolving from the ones herein specified.
Method, strategy, or design:	Both subjects and experimental variables will be controlled and/or manipulated in these investigations. The responses of preschool children from advantaged and disadvantaged socioeconomic backgrounds on simple learning tasks in the presence of social or primary (e. g., candy) rewards will be observed in the first study to add further information about the affects of environmental variability. A similar second study will be carried out to look at the influence of geographic areas of residence (e. g., urban versus rural) on the responses of young children to various kinds of rewards.

Evaluation procedures:	Evaluation of the influences of socioeconomic background, age, and experimental treatments in terms of the quantification of subjects responses is an essential and intrinsic part of the research design. Standard statistical procedure will be used to evaluate experimental affects.
Expected end products of results:	Results from these investigations of the reinforcement potency of various types of reward should provide useful information about the appropriateness of various kinds of rewards in the classroom. This information should facilitate the development and design of more efficient education and change programs. Findings will also be used to develop subsequent research in the area.

Project: Social Rewards as Reinforcers



P-DF

Title: Effects of Distraction upon Auditory and Visual Discrimination

Principal Staff: C. R. Barbrack, I. Buhl

Purpose, objective, or goals: In this project an attempt will be made to demonstrate the effects which two types of distraction have upon auditory and visual discrimination. In addition to comparing the effects of such distraction within a particular sample of lower socio-economic children, data will also be gathered on a group of children from a middle socio-economic level. Several cross socio-economic status analyses will also be performed. The latter analyses might reveal perceptual discriminating abilities and disabilities which are peculiar to particular socio-economic status groups.

Importance, need, or justification: In a recent study Katz and Deutsch (1967) compared perceptual skills of "good" and "poor" readers. Their findings suggest that "poor" readers were less capable on such performance areas of reaction time, stimulus monitoring, discrimination and recall and retention of previously presented material. Buktenica (1966) and others have cited the high incidence of reading retardation in the lower socio-economic status pupils. Buktenica has also demonstrated that there is a significant correlation between reading ability and visual and auditory discrimination ability. Goldman and Sanders (1969) have reported a study which demonstrated a marked disability of lower socio-economic subjects to make correct auditory discriminations in the presence of a noise distraction. These findings are in keeping with the notion that the disorganization and confusion which characterize lower socio-economic homes and families might dispose the child to learn to "tune out" a large portion of environmental stimuli, and thus not learn to adequately deal with distraction, or to detect relevant signals from the other background stimuli. The present study embodies an attempt to examine and compare the ability of middle and lower socio-economic subjects to make correct discriminations in the presence of distraction.

Characteristics of sample:

For the present study two groups of second-grade Caucasian males will be employed. One group (N=30) will be drawn from a middle socio-economic status population and the other (N=30) from a low socio-economic status population and the other (N=30) from a low socio-economic status population.

Method, strategy, or design:

When auditory discrimination is being studied, each subject will be required to perform the same task under three different conditions. The visual discrimination task will also be administered to all subjects under three different conditions.

A modified version of Wepman's Auditory Discrimination test will be employed in each one of the three auditory discrimination tasks. This task will require that the subject discriminate between thirty pairs of words. In Condition I extraneous auditory and visual distractions will be minimized by the use of earphones and blindfolds. The words will be presented by a tape recording. In Condition II "cross mode" (visual) distraction will be controlled, again by the use of blindfolds, but auditory distraction will be introduced. This "same mode" distraction will be in the form of a tape recording of actual classroom noise. The difference between the noise level and the actual discrimination will be held at about 9 decibles. In Condition III "same mode" distraction will be in the form of a 16mm black and white film (without audio) of classroom activity which will be projected on a screen directly in front of the subject. The subject will be required to make auditory discriminations while viewing the film.

The visual discrimination tasks will follow the same procedure. In this case the subject will be required to discriminate between the same thirty pairs of words which were used in the auditory task only this time the words will be projected onto a screen. In Condition I extraneous auditory distraction will be minimized by the use of earphones. Visual distraction will be controlled in as much as the area in which the subject works will be void of any distracting objects save the projection screen.

Method, strategy, or design (continued)

In Condition II "cross mode" (auditory) distraction will be minimized by the use of earphones, but "same mode" (visual) distraction will be introduced. Again the same word pairs will be employed. These words will be superimposed on a 16 mm black and white film similar to the one used in the auditory task. In Condition III "same mode" distraction will be minimized, but "cross mode" distraction introduced. A tape of classroom noise will constitute the auditory distraction and only the word pairs will be projected on the screen.

Counterbalancing will be employed to determine in which mode discrimination will be tested first and also to determine the order of presentation of the three conditions within each mode.

Evaluation procedures:

The exact method of analysis depends upon the results of some pilot work. If we find that the auditory and visual scores are distributed in a very similar fashion, we may take this as a crude indication that the auditory and visual tasks are equivalent. In this case a Lindquist Type VI would be used in which *A* is socio-economic status, *B* is type of distraction, and *C* is the mode in which discrimination is tested.

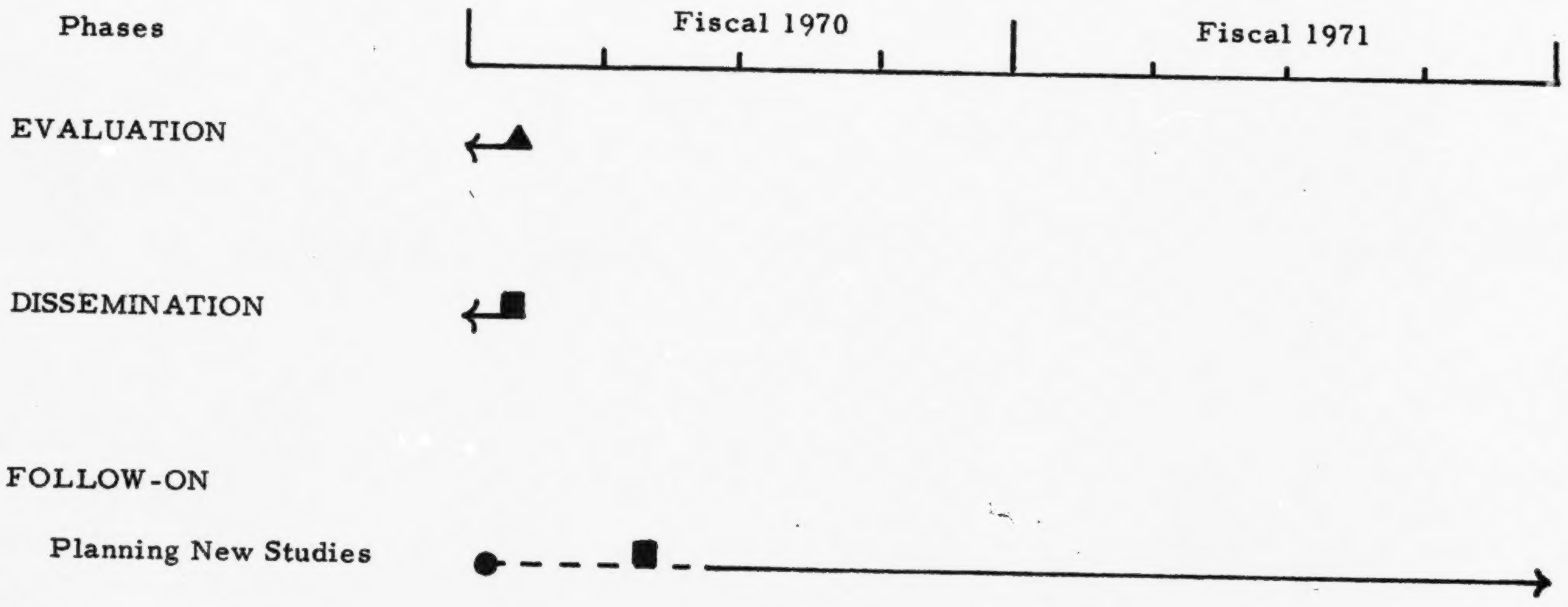
If it turns out that the auditory and visual tasks are not equivalent then a Lindquist Type I will be performed for each mode tested.

In either case a second analysis, using IQ as a covariate, will be performed.

Expected end products of results:

Final report.

Project: Effects of Distraction Upon Auditory and Visual Discrimination



Title: Supportive Activities

Principal Staff: G. Mann, B. Gilmer, J. Camp, I. Buhl

Purpose, objective, or goals: The general purpose is implied in the title of this program. It serves, through the dissemination activities, to tie together the various projects and to disseminate them to a large and varied group of professionals and non-professionals; it serves to supply major research needs across the several projects, particularly in terms of instrumentation. It also provides support for intervention studies through curriculum development and documenting.

Importance, need, or justification: The dissemination project and that of curriculum and materials development serve largely as communication vehicles to disseminate our products to a wide range of persons, both through technical and specific reports to make replications and adaptations possible in other settings, and through publications aimed at a more general audience. Other supportive activities are directed at taking care of certain cross-project needs.

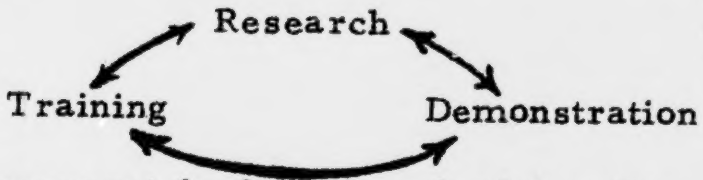
Characteristics of sample and users: Sample: Various. Curriculum development is currently focused on four and five-year-olds, infants, and their mothers. Same for assessment instrument.

Users: These fall into roughly four categories: (1) students in training; (2) professional in early education at all levels, from classroom teachers to the national director of infant schools for one of the British Commonwealth nations; (3) educational and psychological researchers; (4) persons involved in social and political action. We have been particularly concerned with the preparation and distribution of materials suitable for Congressmen, community leaders, and national, state, and local groups concerned with public welfare, especially as it relates to young children.

Method, strategy, or design: Since this characterization is somewhat inappropriate for supportive activities, instead, the role of supportive activities which relate to extra-DARCEE personnel in the overall strategy of the total DARCEE program is

Method, strategy, or design (continued)

presented here. DARCEE has three important components: research, training, and demonstration. Most of the research is supported by OE and some of the demonstration. OEO contributes some funds to research, supports the training operation almost in its entirety, and supports approximately one-half of the demonstration endeavors. The general approach we have taken does not follow a linear model: research--demonstration--training. To attempt to cut down on the decades of lag between research and practical application, we have instead conceptualized our overall strategy as a circular one thus:

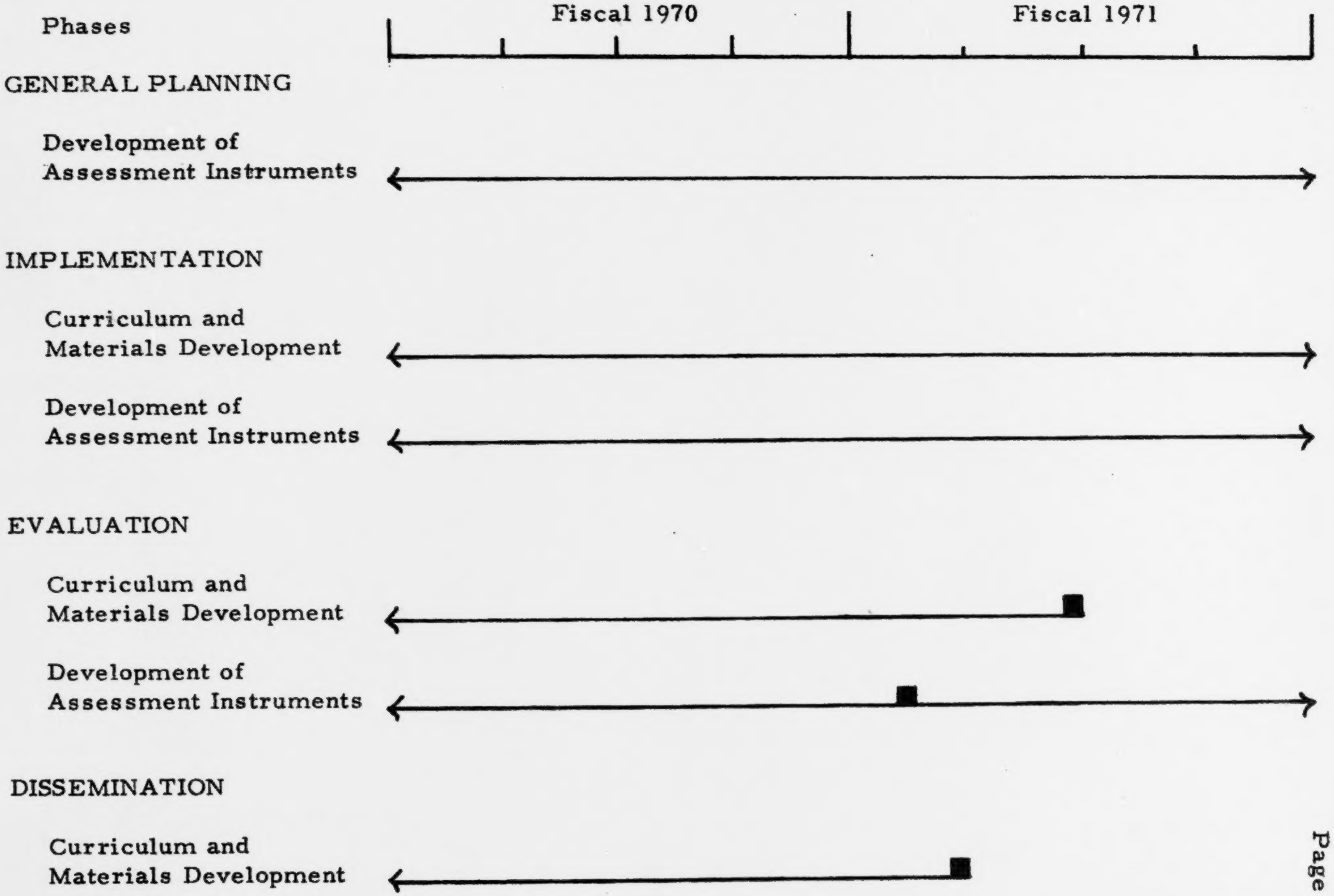


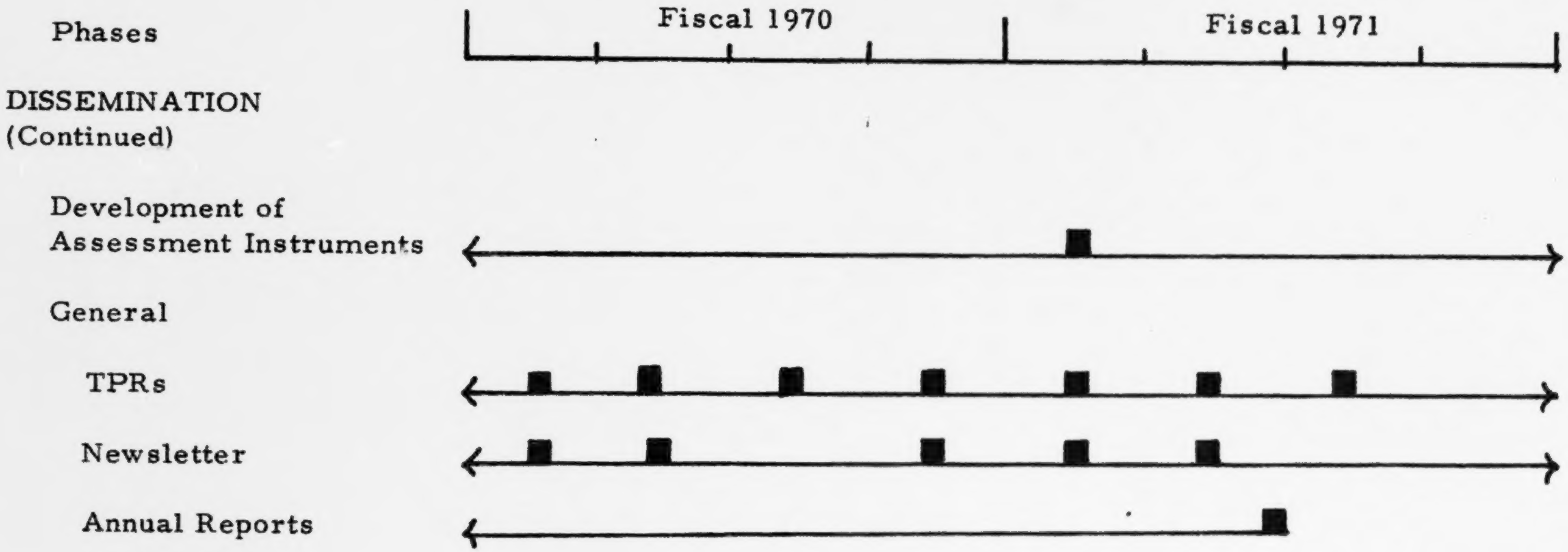
Each major component feeds into each of the other two and also draws from them. In this way research is used in training personnel immediately in our own operation, it is conveyed to the demonstration component, and each of the two latter in turn contribute to the research and to each other. It might be added parenthetically that we consider our career training program one of the most effective ways to shorten the gap between research and training--if we can train persons who can and do assume leadership roles.

Evaluation procedures:

For the assessment project evaluation procedures are built into methods of validating the tests, first on our own sample, and later with extra-DARCEE groups. Since our curriculum approaches are basically the preparation of already validated approaches and materials, further evaluation will largely consist of efforts to keep up with groups who use these materials and to take advantage of what evaluation procedures they are using or that we can jointly work out. Our general demonstration and dissemination efforts are evaluated largely in terms of the general demands for publications as categorized by users and careful records of visitors to our centers and their stated concerns when visiting.

PROGRAM: Supportive Activities




Phases
Fiscal 1970
Fiscal 1971
DISSEMINATION (Continued)
Development of Assessment Instruments
General
TPRs
Newsletter
Annual Reports

P-EA

Title: Development of Assessment Instruments

Principal Staff: B. Gilmer, I. Buhl, J. Bridgman, M. Schoggen, C. Barbrack, C. Mumbauer

Purpose, objective, or goals: A continuing need is that of more precise instruments to assess the effects of intervention programs with young children, especially the general areas of cognitive development and motivational change. In the future, we expect to consolidate efforts and focus primarily on these areas.

We feel that we have diffused our efforts too broadly in the past as a response to need for adequate assessments in almost every area. Our present plan is to concentrate on two areas for the coming year. These are: (1) concept development as related to early education; and (2) assessment techniques for studying the development of independence and a move toward internalization of standards. These are two areas of particular concern in our general intervention approach, for which reason we have chosen them as the focus of our assessment instrument development for the coming funding year.

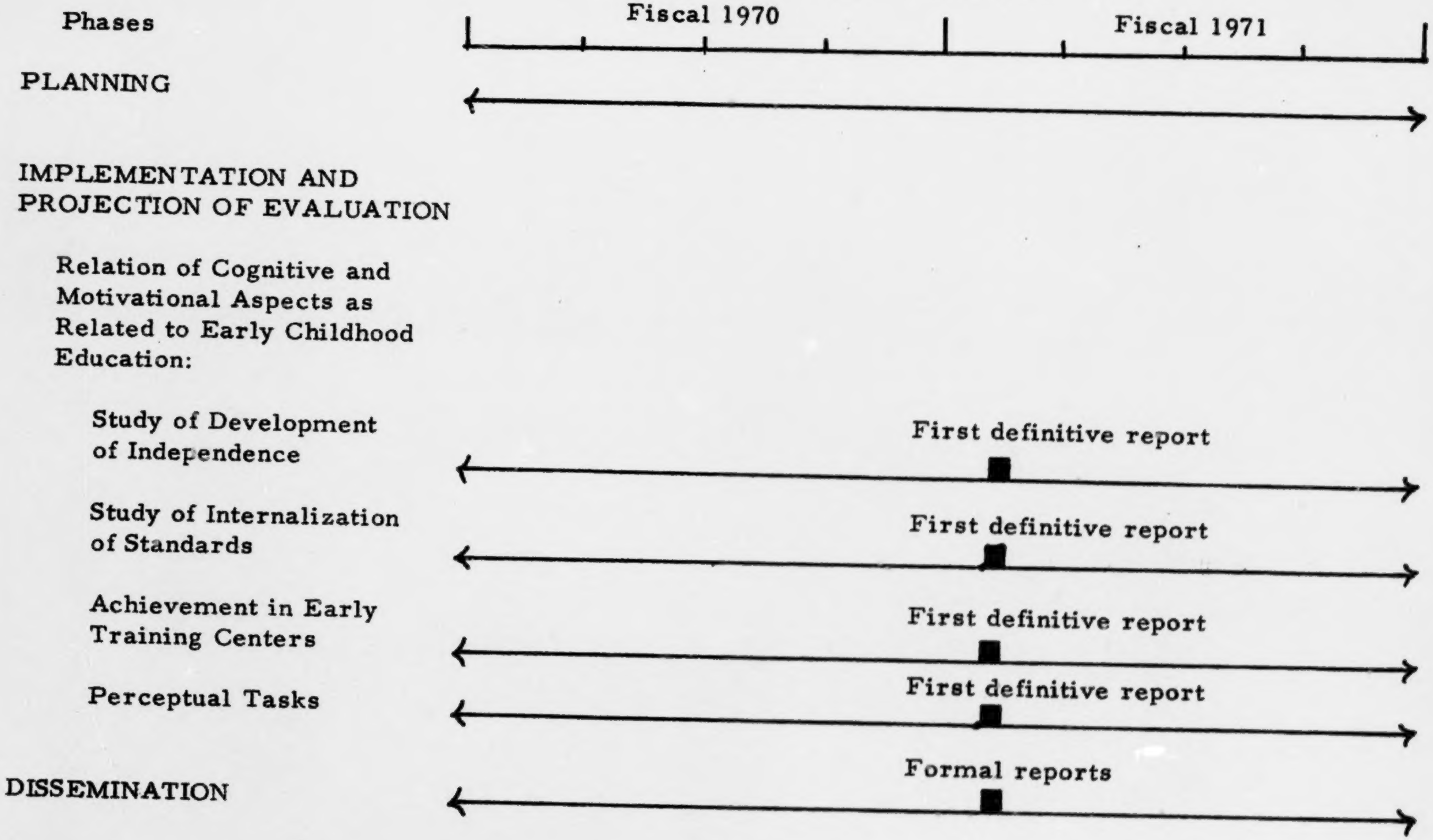
Importance, need, or justification: For several projects, the need has become increasingly apparent for instruments to adequately assess program content and/or to serve as an indicator of achievement. These intruments are used primarily in conjunction with standardized tests or instead of them, if standardized tests are unavailable or inappropriate. This evaluation process serves as a corrective function for future program planning as well as an index of performance.

Characteristics of sample: The samples involved varying according to the design of the inquiry along the dimensions of intervention versus non-intervention effects as well as across age and program content.

Method, strategy, or design: (1) Development of an achievement measure of conceptual development as related to the DARCEE instructional objectives. (2) A study of visual, auditory, and related motor performance and the effects of distraction upon these. (3) Studying the development of independence and internalization of standards within the preschool children.

Evaluation procedures:	Each of these scales, insofar as possible, will be checked for reliability and validity.
Expected end products of results:	Precise program content analysis is the primary end product desired. In addition, we hope to develop unobtrusive measures of behavior for dissemination purposes between programs. The main area of relationship this year will be with the Major Intervention Study which is being planned. Instruments will be specifically planned in terms of the cognitive and motivational aspects of the children's program. In working with the Nashville Head Start programs, these instruments should be of particular value in assessing our adequacy in translating a DARCEE "model" into a regular Head Start framework.

Project: Development of Assessment Instruments



P-EB

Title: Dissemination - Demonstration*

Principal Staff: Information Officer (not staffed at this time); G. Mann, C. Gladding

Purpose, objective, or goals: Dissemination: To make known through printed materials, both general and specialized, and through photographic presentations, the purposes, methods, research results, and accomplishments of DARCEE.

Importance, need, or justification: Internal: Frees the researchers from the heavy burden of visitors and the preparation of non-technical reports.

External: Is the communication link between the external persons and groups and our research and training activities.

Both dissemination and demonstration are built into the organization to close the gap between research and practice, and to facilitate exchange of information among professionals.

Characteristics of users: Users range from professionals to paraprofessionals to laymen--anyone concerned about educability of young children, particularly the culturally deprived.

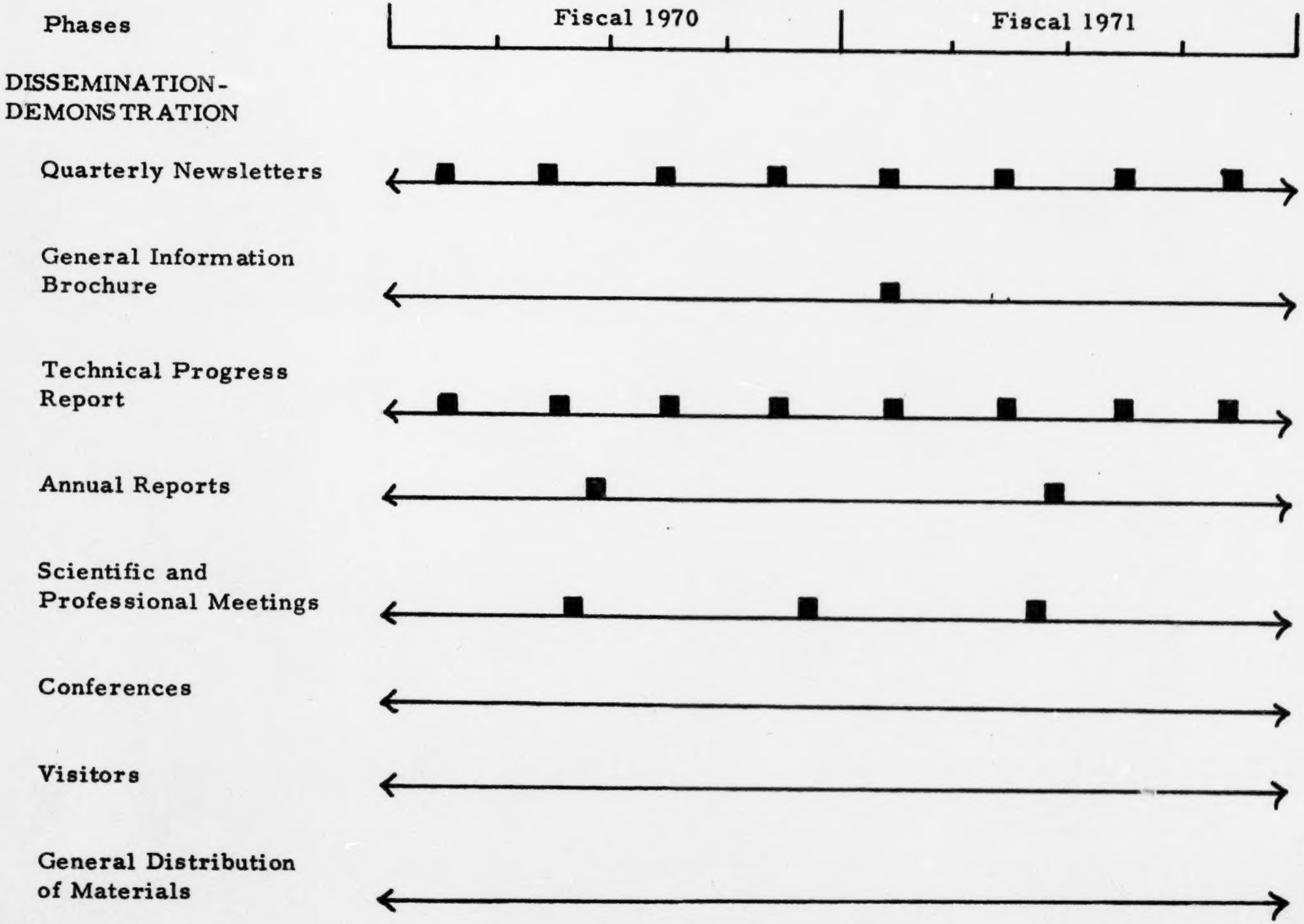
Method, strategy, or design: To accomplish the purposes stated above, the Information Office either produces or maintains the following: (1) newsletters; (2) general information brochures; (3) new stories; (4) training folders to attract students; (5) slide sequences for layment, in-service institutes, etc.; (6) information folders for parents of children in the preschools; (7) information folders for observers at the preschools; (8) duplication and mail-out of research studies; (9) permanent mailing list; (10) a permanent slide file, indexed; (11) a guide for all observers; (12) assistance in providing consultants or speakers for classes, and other groups expressing interest.

Evaluation procedures: Evaluation is measured by: (1) demand for printed materials, (2) use of slides, (3) demand for speakers and consultants, and (4) number of visitors.

Expected end products of results: Same as stated under Method, strategy, or design.

*Funded jointly by the Office of Education and the Office of Economic Opportunity

Project: Dissemination-Demonstration



P-EC

Title: Curriculum and Materials Development*

Principal Staff: J. Camp

Purpose, objective, or goals: To publish and disseminate to the public the relevant aspects of the preschool curriculum developed in the Vertical Diffusion Study, which has been refined and validated in the two demonstration center programs during the past two years of operation.

Importance, need, or justification: There is an urgent need in the field of preschool and primary-grade education for curriculum guides which relate specifically to the educational needs of culturally deprived children. The initiation of many federally sponsored programs for this population of children and the subsequent hiring of many inexperienced professionals and paraprofessionals as teachers, creates a heavy demand for educational supervisors as well as program guides and teacher-training materials. It is imperative that methods, materials, and curriculum design which have been developed and successfully used with both urban and rural, white and black, deprived children be made available for public use.

Characteristics of users: Internal: (1) Teaching staff of the two demonstration Centers, urban and rural. (2) Project directors and personnel in intervention field research.

External: (1) Teachers of young children, both in-service and in-training, at the preschool and primary-grade levels. (2) Students in degree programs specializing in early childhood education, special education, and elementary education. (3) Educational supervisors who are responsible for designing curriculum, selecting instructional materials, and training teachers for the education of young children, particularly deprived children in Head Start and child development centers. (4) Other research and development centers concerned with the education of deprived children and/or the comparisons of intervention treatment effects, using various curriculum approaches.

Method, strategy, or design:

The inability of two persons on this project to participate on the anticipated level of involvement has meant that plans must be revamped and cut down to a more modest size. A series of resource units, carefully tied in with skill and attitudinal development and with accompanying instructions for the obtaining and constructing of instructional materials and devices is scheduled for completion before the end of the current grant year. This series of units will be employed in the DARCEE Early Training Centers in 1969-70, where forty four-year-olds and twenty five-year-olds will be enrolled. As appropriate, materials will be emphasized with our rural five-year olds.

During the next funding year it is anticipated that a major section of the curriculum write-up will be prepared, giving the basic rationale of the DARCEE "model," and the general approaches followed in skill development and in the development of motivations and attitudes congruent with adequate school performance. Also during this time, a section on pre-and in-service training will be prepared.

Materials development activities for the coming year will center around extending the range of appropriate materials for use in our pre-school programs and also some special emphasis on materials which mothers can use in their homes with infants and young children. Plans are under way to develop certain curriculum materials and approaches to use with Indian children. We are currently working with a Sioux Indian group in a Follow-Through program. During the next academic year we hope it will be possible to join forces with the Arizona component on certain materials useful among Papago children. In both these groups, there is a conspicuous lack of materials in the classrooms that are relevant to the Indian culture.

Evaluation procedures:

Internal: Basically, our curriculum for four and five-year-olds has already been validated. We plan during the next funding year to develop more precise instrumentation for evaluating the curriculum, however.

Evaluation procedures (continued)

External: (1) The general field response as indicated by the number of manuals distributed and/or sold. (2) Follow-up on formal adaptation of the DARCEE curriculum. This curriculum is now being tried in Louisville next year and a San Jose project will use it. Also the local Head Start program will use it (cf. Head Start Model Study).

Resources:

Human: Two DARCEE trained curriculum writers; one secretary/typist.

Material: Office supplies for preparing and duplicating copy; photographic supplies.

*Funded jointly by the Office of Education and the Office of Economic Opportunity.

SYRACUSE CENTER FOR RESEARCH AND DEVELOPMENT IN EARLY CHILDHOOD EDUCATION

70706-S

Lab. Cate.	Center Code	Program, Project/Activity Title	Principal Investigator
2.1	S-A	Analysis of Cognitive Behaviors	V. Hall
2.21	-AB	Hierarchial Learning Program	W. J. Meyer
2.12	-AC	Orienting Behavior and Discrimination Learning	W. J. Meyer
2.12	-AF	Child Characteristics and Cognitive Behavior	V. Hall
2.12	-AI	Knowledge Acquisition--Analysis of Young Ss Performance on a Matching Task	V. Hall
2.32	-AK	Assessment of Language Behavior	V. Hall
2.21	-AL	Intervention Planning	V. Hall
2.12	-AM	Temporal Factors in Discrimination Learning	D. W. Smothergill
2.12	-AN	Cognitive Style and Perceptual Recognition	D. W. Smothergill
2.11	-AO	Short-Term Memory (STM) in Children of Different Ages	D. W. Smothergill
2.11	-AP	Levels of Cognitive Functioning in Language	W. J. Meyer
2.11	-AQ	Using Maps Effectively in the Real World	D. W. Smothergill
2.11	-AR	Replication of Experiment on Age Changes in Magnitude of Visual Capture Produced by a Wedge Prism	D. W. Smothergill
2.1	S-B	Social Emotional Program	C. Schwarz
2.12	-BB	Emotional Arousal and Social Context	C. Schwarz
2.12	-BD	Correlates of Peer Attachment Status	C. Schwarz
2.12	-BE	Learning Social Roles	W. J. Meyer

SYRACUSE CENTER FOR RESEARCH AND DEVELOPMENT IN EARLY CHILDHOOD EDUCATION

70706-S

Lab. Cate.	Center Code	Program, Project/Activity Title	Principal Investigator
2.22	-BF	Experimental Modification of the Reinforcement Value of Teacher's Social Responses	C. Schwarz
2.13	-BG	Starting Nursery School II: Prediction of Children's Initial Emotional Reactions from Background Information	C. Schwarz
2.12	-BH	Starting Nursery School III: The Influence of Group Size on Children's Initial Emotional Reactions and Short Term Adjustment	C. Schwarz
2.13	-BI	Starting Nursery School IV: The Influence of Teacher Home Visits on Children's Initial Emotional Reactions and Teacher Effectiveness	R. Wynn
2.32	-BJ	Methods of Assessing Social-Emotional Development	C. Schwarz
2.2	S-C	The Cognitive Deficits Program	W. J. Meyer
2.32	-CA	Assessing Preschool Behavior	W. J. Meyer
2.22	-CG	The Effects of Teacher Style of Communication in the Preschool	N. Smothergill
2.22	-CH	The Effect of Multi-Media Motivational Cues on the Development on Circle/Round Concepts	M. F. Andrews
2.22	-CI	Classroom Procedures and Group Attentional Behavior	R. Wynn
2.22	-CJ	The Effects of Training on Role-Taking Skills and Non-Egocentric Communication	N. Smothergill
2.12	-CK	Probability Learning in Preschoolers	N. Smothergill
2.22	-CL	Concept Learning in Free Play and Structured Settings	W. J. Meyer

Title: Analysis of Cognitive Behaviors

Principal Staff: V. Hall, W. J. Meyer, D. Smothergill, N. Smothergill

Purpose, objective, or goals: To examine, using diverse methodological strategies, the cognitive capabilities of normal four-year-old children. Secondly, this program examines the influence of several independent variables on cognitive behavior. A third objective is the development of a behavioral assessment instrument sensitive to the identification of intellectual skills that underlie a variety of cognitive behaviors.

Importance, need, or justification: Although there are many approaches to fostering the cognitive growth of four-year-olds, it is unclear why these approaches are successful (not successful). Meaningful intervention can occur only when there is a more precise understanding of underlying cognitive processes or intellectual skills that generate transfer across diverse situations. Identification of these intellectual skills will also contribute to a more precise understanding of cognitive deficits as they occur in children with learning disabilities.

Method, strategy, or design: The overall program strategy involves three stages, two of which occur simultaneously. Initially, studies will be conducted which will be relatively narrow in scope; that is, they will involve one or two variables. Procedurally, these studies will use laboratory methods as well as direct observations of behavior in relatively well defined classroom situations. Second, as techniques become apparent from the research studies, they will be developed and used in small groups (N=5) and thus, if feasible, larger groups (N=10-18). Second stage studies are also currently underway where the procedures are defined by the teachers; that is, the teachers are now engaged in defining objectives and developing materials and methods for attaining these objectives. The cognitive deficits

Method, strategy, or design (continued)

project is also in stage two. The third stage involves a more generalized large scale field testing of the more promising techniques. At the present time, the Language Development project is consistent with the phase three definition.

Characteristics of sample:

The projects involve children from the Laboratory Nursery School. These children are representative of the middle-middle class and will attend kindergarten in the same school district. A second large population used in this program are representative of the "inner-city".

Expected end products of results:

The following end products are anticipated:

1. Technical research reports.
2. Relatively precise descriptions of the cognitive competencies and deficiencies of four-year-old children.
3. A field-tested program for fostering language development.
4. A field-tested program for fostering perceptual-motor development.
5. A description of what cognitive abilities are fostered by various nursery school classroom materials.

Evaluation procedures:

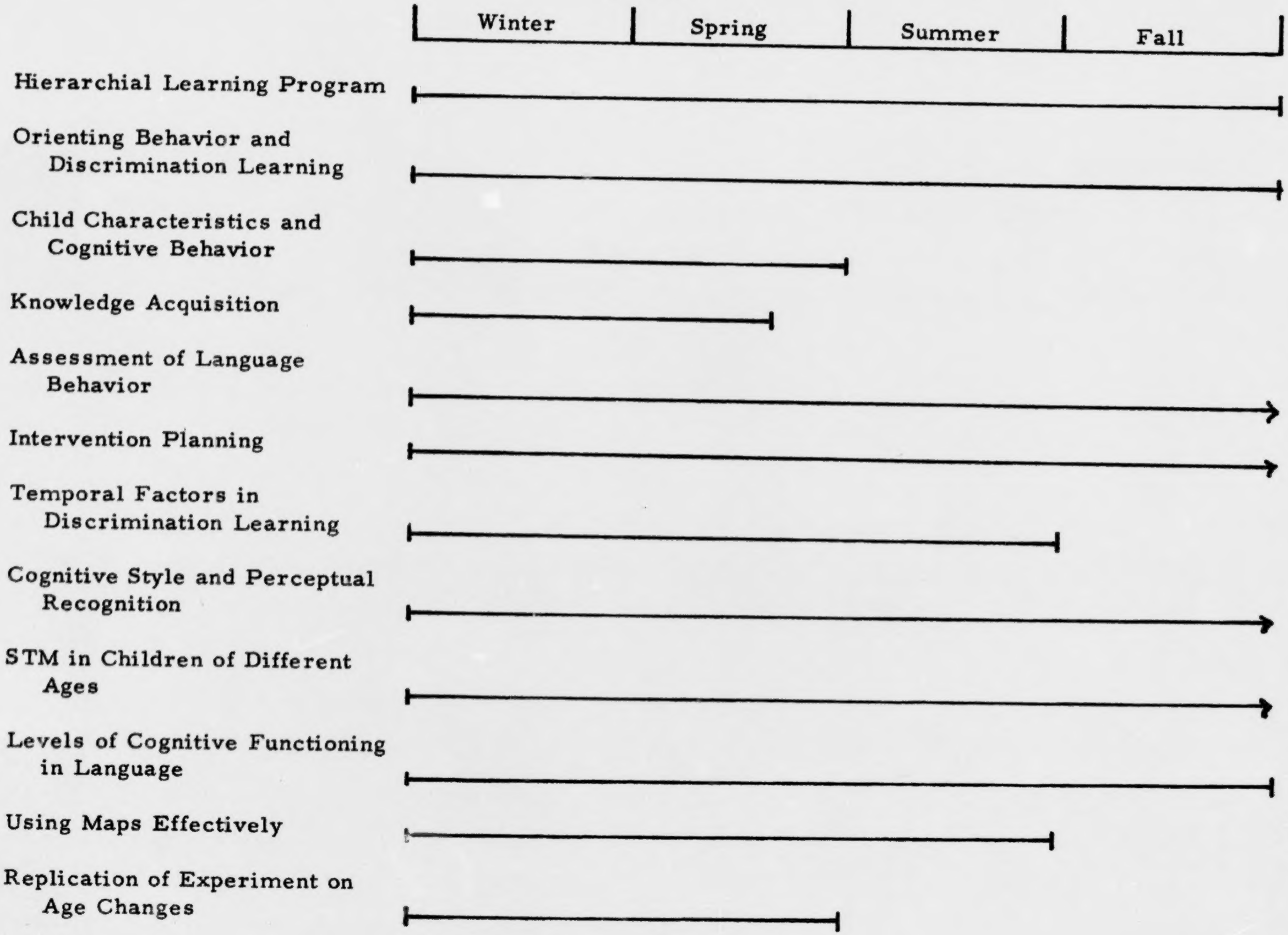
Program evaluation is defined in terms of our ability to specify the intellectual skills required for a diversity of preschool educational activities.

Relationship to other programs:

The cognitive deficit program derives much of its emphasis from this program. Thus, knowledge gained from the research projects will be incorporated into curriculum materials permitting a translation of identified intellectual skills into curriculum programs. It is also clear that cognitive competencies are related to social-emotional development and behavior in the sense that affective responses to stimulus situations certainly have a cognitive component. In addition, the objectives of the social-emotional program include development of procedures for reducing the fear-producing qualities of certain aspects of classroom and other learning situations.

Flow chart:	Attached.
Linkages within program:	Each of the projects is concerned with a different class of cognitive behavior and with somewhat different strategies for fostering development. The relationships among the projects exist because each relies on appropriate orienting behavior, understanding of concepts transmitted through language, and specific cognitive characteristics of the children.

PROGRAM: Analysis of Cognitive Behaviors
1969-1970



S-AB

Title: Hierarchial Learning Program

Principal Staff: W. J. Meyer

Purpose, objective, or goals: To develop a hierarchial learning program focusing on perceptual-motor behavior. Specifically, antecedent behaviors will be identified, followed by the development of intervention procedures.

Importance, need, or justification: Although perceptual-motor behaviors (performance on the Bender-Gestalt) are felt to be crucial to reading, the antecedents of these behaviors are not understood. This project is an attempt to identify these antecedents and create techniques for fostering their development.

Method, strategy, or design: Initially, the strategy involves working intensively with individual children. Behavioral situations will be created for them and their observed responses will serve as a preliminary basis for identifying required capabilities. The next step involves the definition (arm chair) of a possible hierarchy and testing it. Continued modifications will be made until a stable set of responses is achieved. After this is accomplished, intervention procedures for each hierarchial level will be defined.

Characteristics of sample: Preschool and kindergarten children of both middle-middle and lower-class status.

Expected end products of results: A set of intervention procedures related to a hierarchial set of behaviors required for mature perceptual-motor behavior.

Evaluation procedures: Field testing of the hierarchy will be conducted followed by testing the remedial programs in the classroom situation.

Relationship to other projects: This project may have a relationship to the Orienting Behavior work in that it is highly probable that adequate attentional behavior is an antecedent of perceptual-motor behavior.

Flow chart: Through Fiscal 1970.

S-AC

Title:	Orienting Behavior and Discrimination Learning
Principal Staff:	W. J. Meyer, J. Dusek, M. Ross
Purpose, objective, or goals:	To examine the visual scanning strategies used by preschool children in problem solving situations.
Importance, need, or justification:	There is ample reason to believe that the attentional behaviors of children play a significant role in the learning process. This aspect of behavior is largely unexplored at least with respect to subject variations and stimulus variation. This project will focus on these variables.
Method, strategy, or design:	Initial work in this area will involve laboratory procedures and the systematic examination of single variables (subject or stimulus).
Characteristics of sample:	The Laboratory Preschool and Kindergarten children.
Expected end products of results:	Technical reports to be published in various professional journals.
Relationship to other projects:	This project is particularly related to the Quantitative Concepts project because it involves visual scanning and at least two stimulus attributes (member and form).
Flow chart:	This project will continue through Fiscal 1970.

S-AF

Title: Child Characteristics and Cognitive Behavior

Principal Staff: V. C. Hall, Norma Reali, Lydia Seggev, Richard Salvi

Purpose, objective, or goals: To determine the antecedents of conceptual tempo and examine the effects of several manipulations on reflective and impulsive Ss.

Importance, need, or justification: While educators continually talk about the importance of individual differences, it is often difficult to list what dimensions of difference are important and what effects specific teacher behaviors have on Ss differing on these characteristics. The present project is trying to determine the importance of conceptual tempo and the effects of different situations on Ss differing on this characteristic.

Method, strategy, or design:

1. The study investigating the influence of expectance of success is completed and a final report is being submitted.
2. The replication of the study manipulating presentation speed on a paired associate task is completed and the data is being analyzed.
3. A third study is being designed to determine the effect of supplying relevant information to impulsive children on their decision time.

Although the third study is just now being designed it is possible to give a general idea of the procedures which will be followed. Past attempts at modification procedures have concentrated on slowing the impulsive Ss down without giving them more information. The assumption has been that if the Ss take more time they will think about their decision. No one has as yet considered the possibility that the impulsive S does not know how to evaluate hypotheses or does not have the appropriate information available. The goal of this research is to test out this alternate hypothesis.

Characteristics of sample: 3. We expect to use first and second graders.

Relationship to other projects:	3. This project is a continuation of a long term interest of the present center concerning conceptual tempo.
Flow chart:	2. The data for the second study will be analyzed this month (June, 1969). 3. Planning for the Third study will occur during July, August and September. The study will be carried out during the first semester and analyzed in the spring, 1970.

S-AI

Title: Knowledge Acquisition--Analysis of young Ss performance on a matching task.

Principal Staff: V. C. Hall, Lydia Seggev

Purpose, objective, or goals: The purpose of the present project is to illustrate with empirical data, what the authors believe are common but often neglected problems when the inability of young children to perform a specific task is used as evidence for maturational deficiency.

Importance, need or justification: This is a continuation of the series of studies looking at the evidence used as justification for delaying training. If, indeed children are unable to learn certain criterion tasks at particular age levels then schools need to know what the limits are. If on the other hand the inability is merely due to poor task analysis on the part of the E we need to use this information in developing curriculum.

Method, strategy, or design: The present task is one used by Hutenlocher to test young Ss ability to match sample blocks or letter-like forms. The present study is designed to indicate that this poor performance is due to the poor communication on the part of the E. As described in an earlier report the present Es have analyzed the task and believe it can be taught quite easilty.

Characteristics of sample: The sample will consist of nursery school Ss.

Evaluation procedures: Performance of control Ss will be compared to that of the trained experimental group.

Relationship to other projects: This is a direct application of the emphasis placed on the analysis of criterion behaviors (ala' Gagne) outlined in the Center's proposal.

Flow chart: The training procedures have been designed but acquiring Ss has been difficult. The study will be completed during Fiscal 70.

S-AK

Title:	Assessment of Language Behavior
Principal Staff:	V. C. Hall, Michael Mery, Richard Salvi
Purpose, objective, or goals:	To develop and validate language evaluation instruments.
Importance, need or justification:	The need for evaluation has been the focus of several Steering Committee meetings as well as being mentioned with increasing frequency in the literature.
Method, strategy, or design:	During the language intervention work and as a result of reviewing the literature we have presented the following instruments to young Ss. The MFF, the Krauss ambiguous figures, a letter task, a paired associate task. The results of these tests and our evaluation of them as valid instruments for language intervention evaluation is presently taking place. From our work we hope to continue working on language evaluation instruments.
Characteristics of sample:	Young Ss with varying degrees of language proficiency.
Expected end products of results:	Several validated language evaluation instruments.
Evaluation procedures:	This will vary with the instrument and sample.
Relationship to other projects:	Part of the evaluation program,
Flow chart:	During the summer of 1969 we plan to evaluate the instruments we have data on and develop possible new approaches. These new instruments will then be evaluated the following year. This should be a continuous process.

S-AL

Title:	Intervention Planning
Principal Staff:	V. C. Hall, G. Simpson
Purpose, objective, or goals:	The present investigators plan to spend next year preparing for a major intervention program to be instituted in the year 1970-71. The purpose is to institute the best possible training program for an urban first grade school attended by poor urban black children. This school is located on the Syracuse campus. Another primary purpose is to plan the best possible evaluation program for this project.
Importance, need, or justification:	This intervention project is a major opportunity to test intervention programs using the knowledge we presently have. It is hoped that through a year of careful planning we will be able to make important contributions to early childhood education.
Method, strategy, or design:	In conjunction with the college of education at Syracuse we hope to survey possible curriculum, make community contacts, and design a careful evaluation procedure. The specific strategy would consist of (1) plan (2) intervene (3) evaluate (4) replicate.
Characteristics of sample:	The sample will consist of first grade Ss and their parents.
Expected end products of results:	The end result would be a packaged curriculum for lower class parents and children which has been empirically validated.
Evaluation procedures:	This will be part of the planning outcome.
Relationship to other projects:	This is of course congruent with both this center's goals and the goals of the entire national lab.
Flow chart:	This project will run for at least two to four years. As indicated earlier, the first year will be a planning year and the subsequent year will be occupied with intervention.

S-AM

Title: Temporal factors in Discrimination Learning

Principal Staff: D. W. Smothergill, R. Wheeler

Purpose, objective, or goals: To determine if the mechanisms involved in solving two-choice discriminations are the same or different when the problem is presented simultaneously vs. presented successively.

Importance, need, or justification: To understand information processing in development requires knowledge about what is psychologically different when the elements of a problem are present and when some must be remembered.

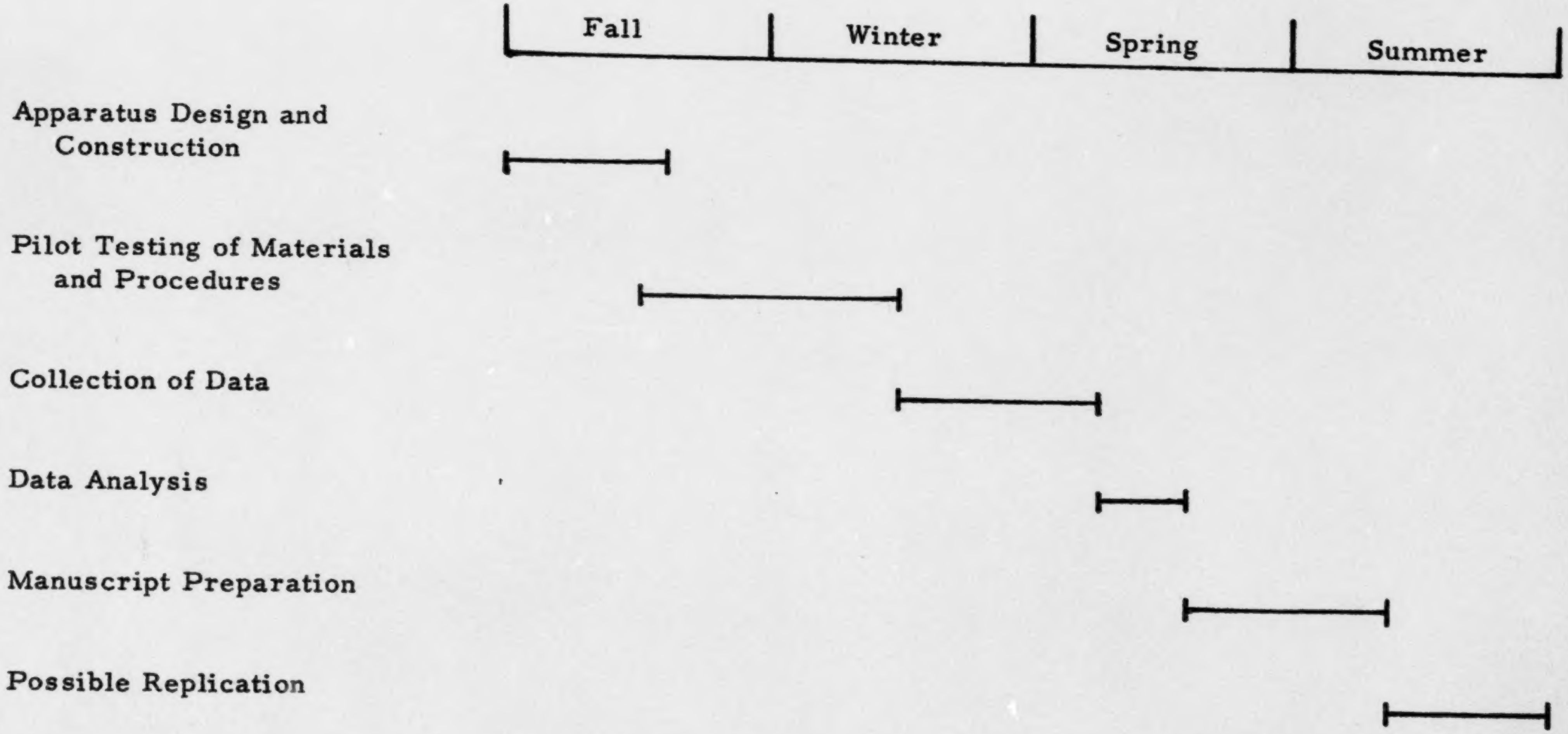
Method, strategy, or design: Two studies are planned. First, baseline data will be collected on the speed with which a two-choice simultaneous discrimination is learned. The discriminada in this study and the one described below will be difficult to differentiate (as ascertained by pilot work) and a same-different judgment will be the required response.

The second study will manipulate three variables; the *delay* between offset of one discriminada and onset of the second, the *control* *S*s exercise in determining when one discriminanda is terminated and the inter-discriminanda-interval begins, and the *number* of independent looks at each discriminanda. Three instances of the delay variable are projected: 2, 5 and 10 secs.; although, the actual selection of delays will be determined by pilot testing. On the control variable, there will be two conditions. In one, the *S*s will be allowed to determine when they wish to terminate one discriminanda and initiate the delay interval. In the second condition these events will be controlled by *E*. Two levels of the number of looks variable will be studied. The *S*s assigned to one level will be allowed to review each discriminanda just once before responding. In the second condition, *S*s will be permitted to view each discriminanda as often as they wish before responding so long as a cumulative time limit is not exceeded.

Characteristics of sample:	It is anticipated that male and female third graders will constitute the sample.
Expected end products of results:	Information on the mechanism responsible for the often reported difficulty in learning a successive discrimination.
Evaluation procedures:	Criticism by colleagues, submission of manuscript for publication.
Flow chart:	See attached chart.

Project: Temporal Factors in Discrimination Learning

1969-1970



S-AN

Title: Cognitive Style and Perceptual Recognition

Principal Staff: D. W. Smothergill

Purpose, objective, or goals: To determine the relationship of cognitive style to perceptual behavior.

Importance, need, or justification: The cognitive style concept has proved itself a good generator of research. The point within information processing at which the concept is operative is unclear. Does it function in learning, remembering, perceiving, or throughout the system? This research will investigate the cognitive styles variable on perceptual recognition tasks which assure equivalent knowledge of the correct response for all *S*s.

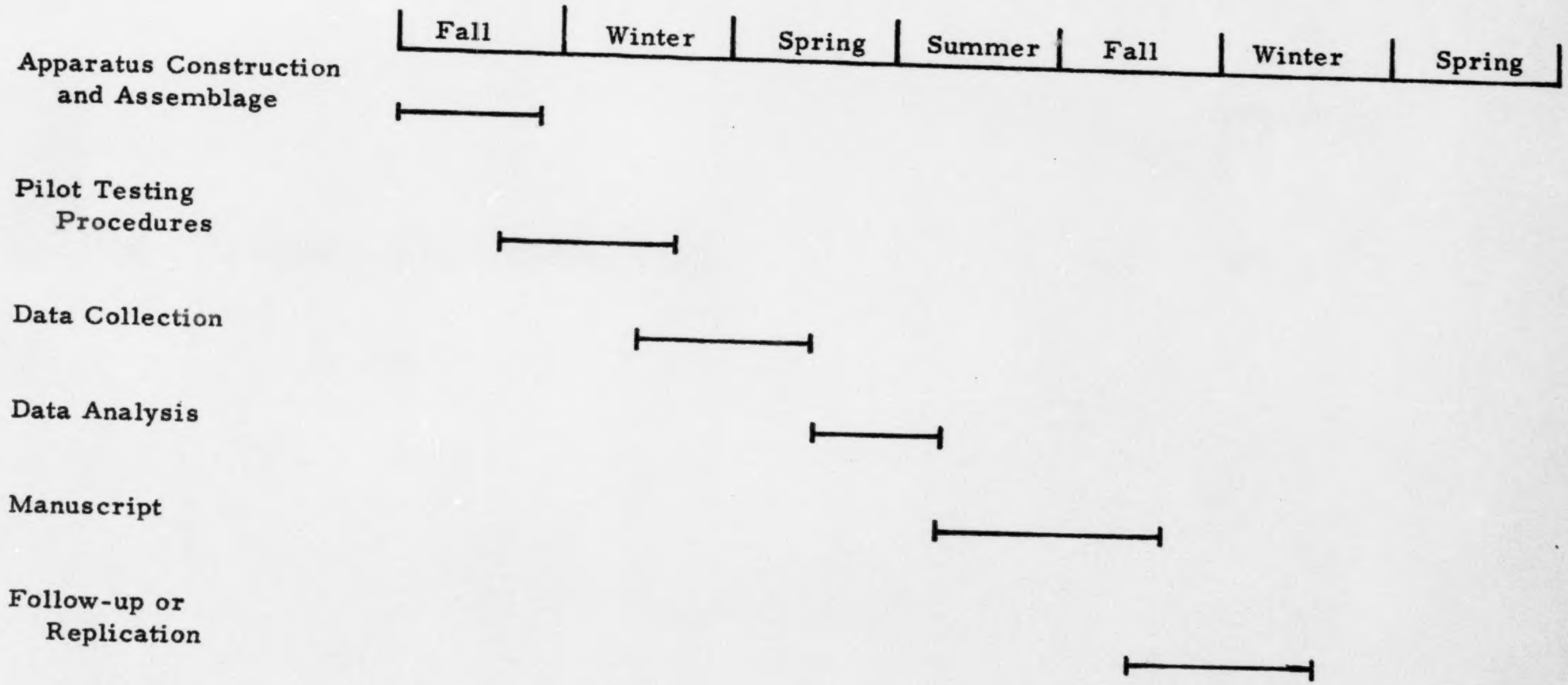
Method, strategy, or design: A population will be administered the Matching Familiar Figures (MFF) test in order to form samples of impulsives and reflectives. All *S*s will then be taught that one set of forms belongs to one category ("stars") and a second set belong to another category ("chiefs"). The forms will be selected from Gibson's letter-like forms. The four forms comprising one set will each be different standards. Two of the forms in the second set will likewise be different standards while the other two will be transformations of two of the standard forms of the first set. Constituting the sets in this manner produces relatively easy categorization (when the form is a standard which has no transformations among the other forms) and relatively harder categorization (when the form is either a standard which has a transformation among the sample of forms or if it is a transformation). After all have learned the categorization, the forms will be individually presented, tachestoscopically for very short durations on a screen. All *S*s will be told to categorize the form as quickly as possible by saying the proper name aloud. Tentatively, we are considering connecting a voice key to the exposure device so that *S*'s response will simultaneously terminate the projection.

Characteristics of sample: Middle-class males and females between seven and nine years old.

Expected end products of results:	Further understanding of operation of the conceptual tempo mechanism.
Evaluation procedures:	Preparation of manuscript and submission to appropriate journal.
Flow chart:	See attached.

Project: Cognitive Style and Perceptual Recognition

1969-1970-1971

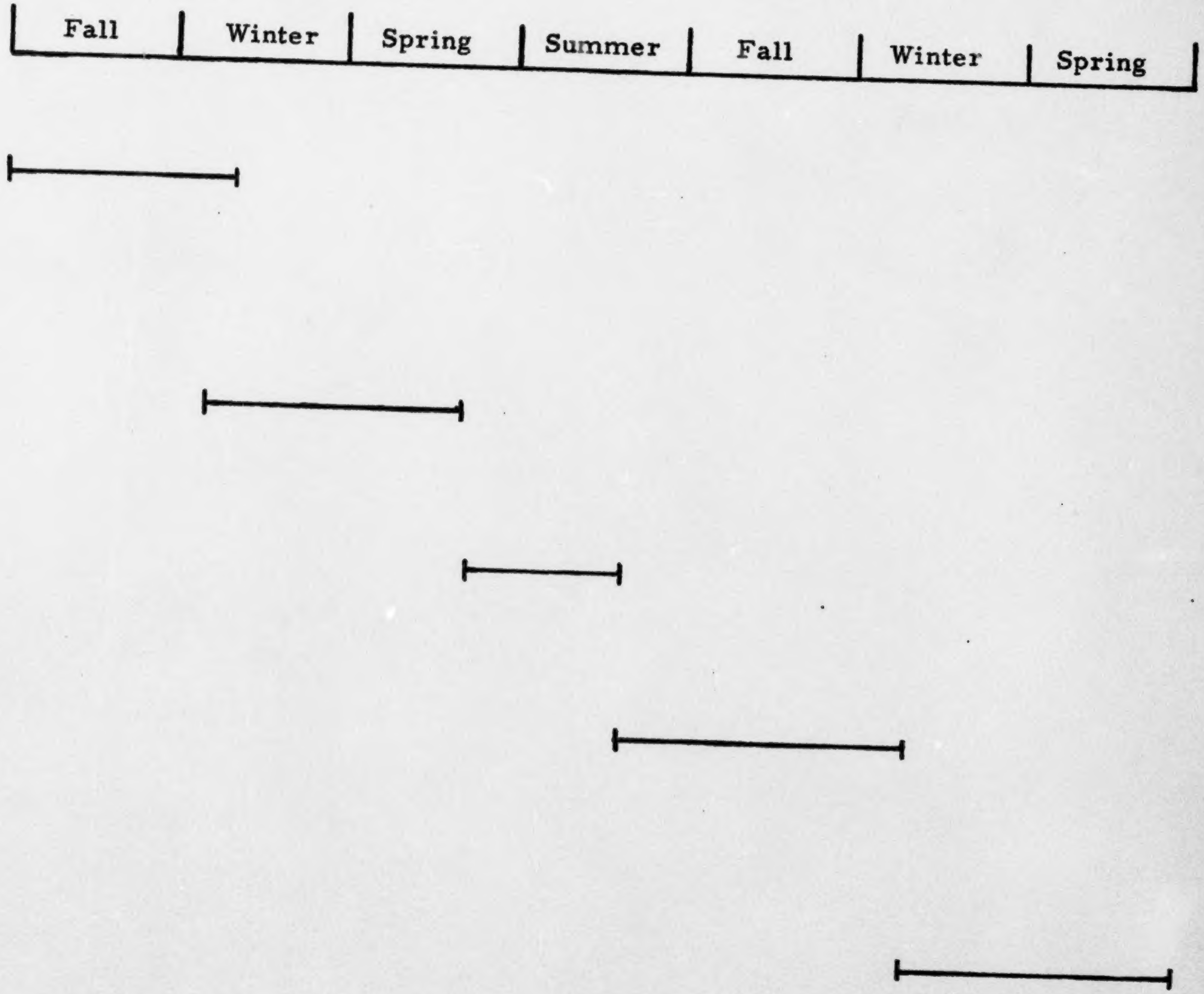


S-AO

Title:	Short-term memory (STM) in children of different ages.
Principal Staff:	D. W. Smothergill, R. Wheeler
Purpose, objective, or goals:	1. To develop techniques for assessing STM in children. 2. To test and develop theoretical accounts of how the initial stages of information processing change with age.
Importance, need, or justification:	The information processing approach has made strong inroads into the domain once studied by learning theorists. The new approach has been profitable and promising. Little has been attempted in the way of extending the techniques and ideas of this approach to children. It could produce some rigorous, testable hypotheses about what changes and how it changes in the growing child's intellectual encounters with the world.
Method, strategy, or design:	This is the first objective of the research: to develop techniques and methods usable with young and older children. Very generally, projectors and timing devices will be employed to present visual stimuli for precise, and relatively short duration. The basic question concerns what the child sees and how long he remembers what he saw. As information processing theorists have formally shown, these are more the same than separate questions. Initially, we will work with recognition techniques and, perhaps, same-different judgments of successively presented material.
Characteristics of sample:	Open at this point. Hope to study children as young as early preschool.
Evaluation procedures:	Indicators of progress will be the development of reliable techniques to be used with young child and testing of hypotheses using these techniques.
Flow chart:	See attached chart.

Project: Short-Term Memory (STM) in Children of Different Ages

1969-1970-1971



Assemblage of equipment, development of facility in using it

Pilot work developing procedures and technique for both presenting stimuli and obtaining responses

Evaluation of progress, refine techniques, develop hypotheses

Secure sample of Ss, conduct study developed previously

Evaluate results of research, adapt hypotheses and techniques to each other. Conduct a second study.

S-AP

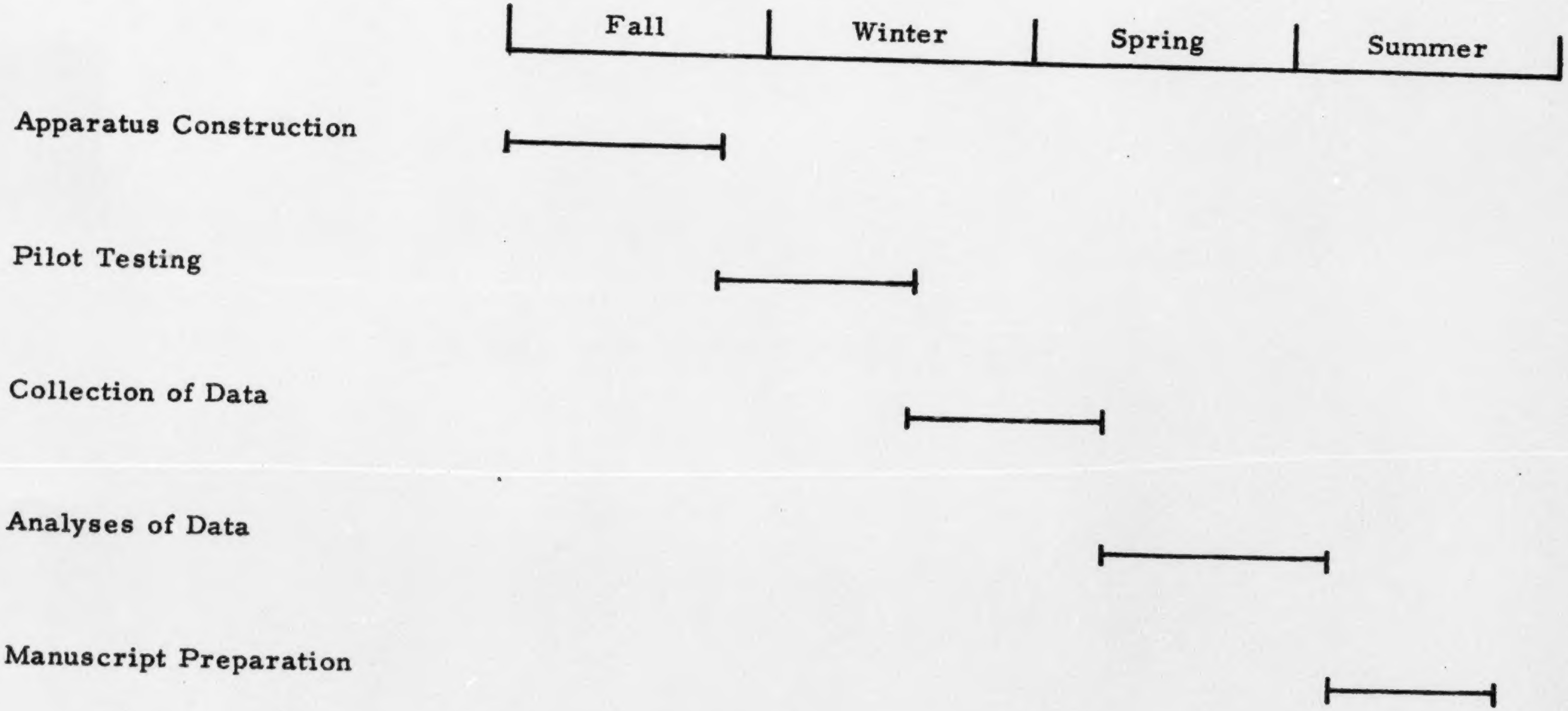
Title:	Levels of Cognitive Functioning in Language
Principal Staff:	W. J. Meyer, G. Simpson
Purpose, objective, or goals:	To compare the ability of four-year-old children to handle concrete as opposed to abstract language. In one situation children will be asked to label pictorial stimuli and then will be asked to define the same stimuli in terms of a verbal representation (such as the Vocabulary item on the Stanford-Binet). A third condition involves asking the children to define an object when it is presented in both two and three dimensions.
Importance, need, or justification:	Many intervention language programs stress the learning of verbal labels on the emplicit assumption that the child also acquires the ability to treat the labels in a representational (the label replaces the physical presence of the object), manner. This assumption requires empirical verification because if it is not correct then possibly language intervention procedures should be changed.
Method, strategy, or design:	There are 12 stimulus pictures taken from the Picture Vocabulary subtest of the Stanford-Binet. The verbal labels identifying these pictures are the vocabulary words for the assessment of representational ability. A counterbalanced presentation order will be used providing a within groups design.
Characteristics of sample:	Both culturally advantaged and culturally disadvantaged four-year-old children will be employed. Both race and sex are subject characteristics which will be examined.
Expected end products of results:	A better understanding of your children's ability to use language to represent objects not physically present.
Evaluation procedures:	See "method" section.
Relationship to other projects:	Project clearly relates to the Language Intervention Project--it may help to define the content of the intervention procedures.
Flow chart:	Will be completed at the end of Fiscal, 1970.

S-AQ

Title:	Using Maps Effectively in the Real World.
Principal Staff:	D. W. Smothergill, R. Wheeler
Purpose, objective, or goals:	To study the development of ability to use a quasi-symbolic cognitive aid: a map.
Importance, need, or justification:	A map is a crude form of representation of the real world. Many theorists agree that representational ability improves markedly in early childhood. Careful study of different-aged children's use of maps could aid understanding of the development of representational abilities.
Method, strategy, or design:	Relief maps of both classrooms children attend daily and unfamiliar settings will be constructed. The E points to different locations on the map and S must find small objects hidden in the corresponding real locations. If the S can do this well the map will then be presented at orientations to him which differ from his orientation to the represented environ. The same procedure mentioned above will be followed.
Characteristics of sample:	Preschool, mostly middle-class, white.
Expected end products of results:	Knowledge about development of symbolic processes.
Evaluation procedures:	Criticism by colleagues, submission of manuscript of work for publication.
Flow Chart:	See attached chart.

Project: Using Maps Effectively in the Real World

1969-1970



S-AR

Title: Replication of Experiment on Age Changes in Magnitude of Visual Capture Produced by a Wedge Prism.

Principal Staff: D. W. Smothergill; R. Wheeler

Purpose, objective, or goals: To replicate procedures employed by the author previously in order to determine whether an unexpected result will replicate.

Importance, need, or justification: The technique of using displacing prisms to study spatial functioning in children has been used by us and others. In the course of our work an anamolous finding occurred which made no sense within the conceptual framework we were, and are, using. Specifically, when six year olds are asked to locate their finger which is viewed through a wedge prism, a large percentage are more invluenced by the prism than when asked to locate a pencil under identical conditions. For adults, almost none behave this way. Our conception of what occurs in this situation does not allow for any aged S to behave in the unusual fashion. Perhaps then the findings were due to random error produced by too few trials administered per S and/or the aberrant sample. If the proposed research replicates the previous findings these possibilities would seem less possible and the task of accounting for the unusual results could be undertaken.

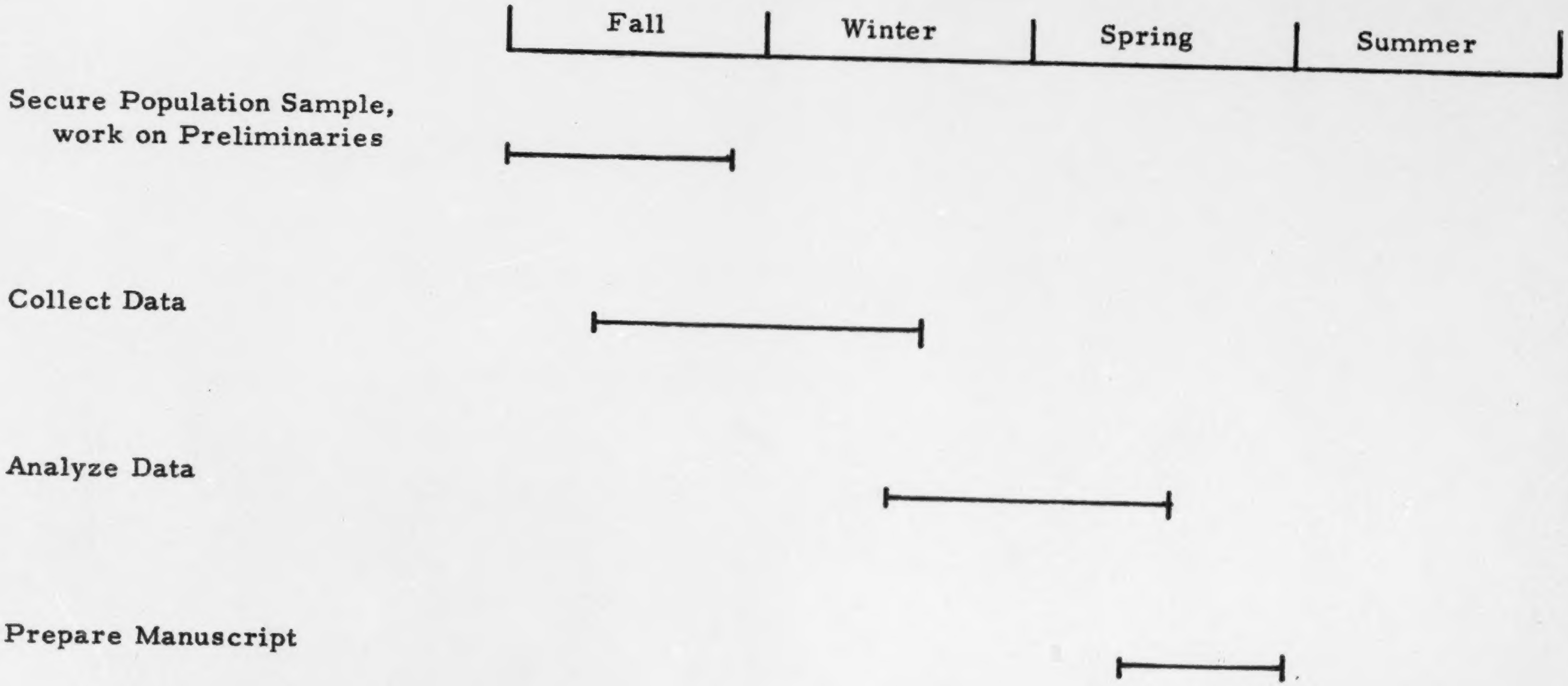
Method, strategy, or design: The Ss will all experience several trials of four conditions. In three conditions the target is S's own finger. In two of these three the finger is viewed through a wedge prism, the response in one condition being to where the finger "looks to be" while in the other condition it is directed to where the finger "feels to be". The third condition using the finger as target requires responding to the fingers actual location with eyes closed. The fourth condition involves pointing to a pencil viewed through the wedge prism.

Characteristics of sample: Male and female Ss aged six, nine, and adults will be used.

Expected end products of results:	Knowledge of whether a real or spurious phonomenon was found in the original research. If the former, our present framework will have to be revised to accommodate it.
Evaluation procedures:	Submission of a paper to a journal or reading at a convention.
Flow chart:	See attached.

Project: Replication of Experiment on Age Changes in Magnitude of Visual Capture Produced by a Wedge Prism

1969-1970



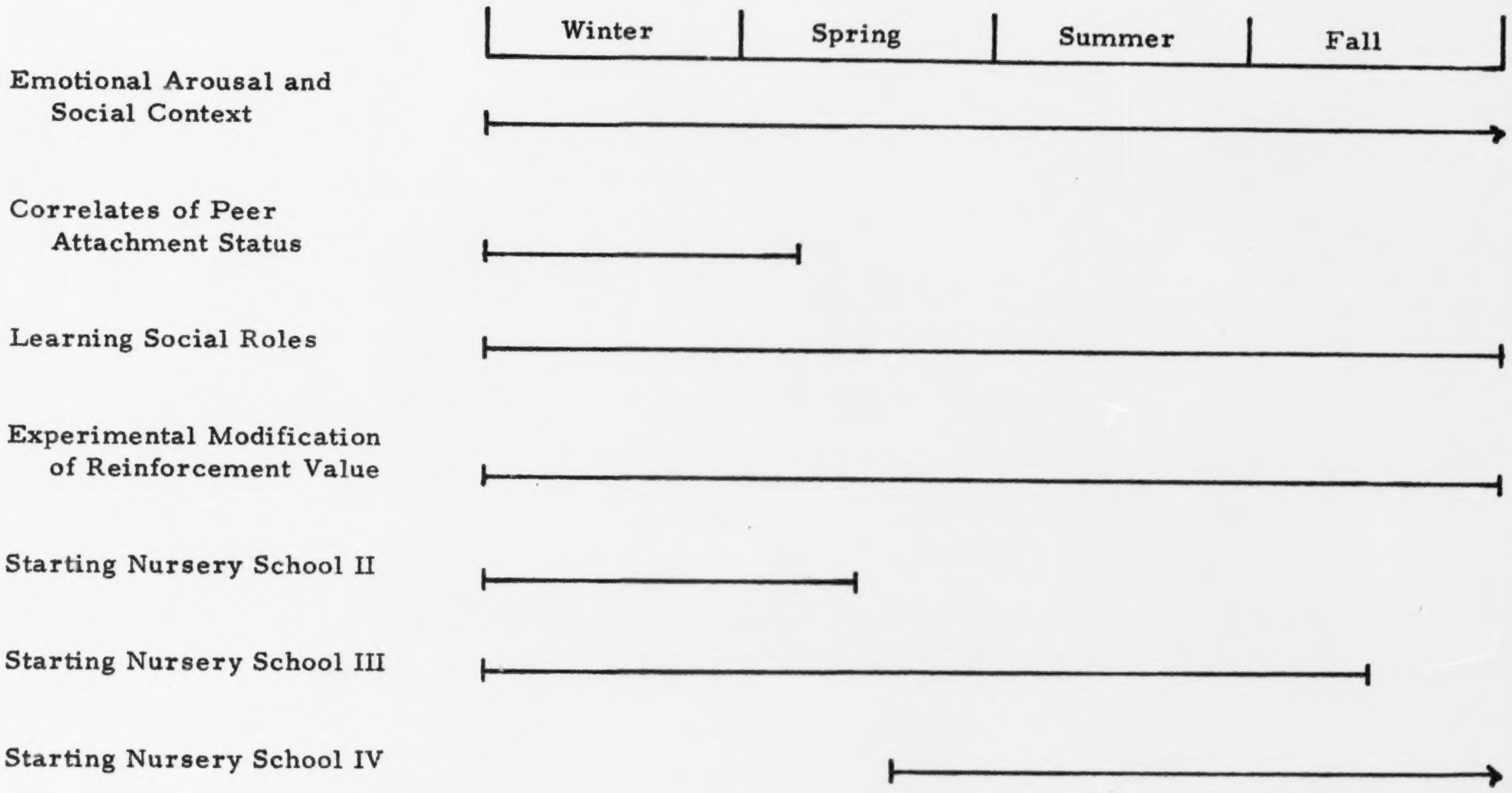
S-B

Title:	Social Emotional Program
Principal Staff:	C. Schwarz, W. J. Meyer, R. Wynn
Purpose, objective, or goals:	To study the social and emotional responses of children in the nursery school, children in the context of school situation, and to explore procedures which may foster social-emotional growth.
Importance, need, or justification:	An important aspect of child growth and development involves the ability to cope with emotional states and to learn appropriate social responses and social rules. The projects in this program focus on the variables influencing these developmental changes and examine a procedure for fostering social-role learning. Much of this work examines largely unexplored domains of child development and should contribute to understanding of this component of behavior.
Method, strategy, or design:	The general program strategy is to assess the variables that stimulate emotional, as measured by physiological monitoring systems, responses. The experimental situations are pseudo-realistic and are designed to arouse emotional responses. As these variables are identified, an effort will be made to discover variables which will modify emotional reactions. One project will assess, using observational procedures, the relevance of "dress-up corners" in the learning of social roles.
Characteristics of sample:	The children employed in this project come from both the lower- and middle-classes. The potential users of the program outcomes would certainly include early childhood educators as well as those individuals concerned with understanding the social-emotional development of young children.
Expected end products of results:	Many of the final products derived from this program will be in the form of technical reports in appropriate professional journals. One of the projects (Parent-Child Separation at Preschool) may indicate that current practices of focusing on separation may be inappropriate.

Evaluation procedures:	See methods section.
Relationship to other programs:	The projects may provide an awareness of how emotional reactions to school situations can be avoided, thus permitting greater opportunities for cognitive growth.
Flow chart:	Attached.
Linkages within program:	The projects being conducted by Dr. Schwarz are concerned with varying aspects of variables influencing affective arousal. Each of the three projects will provide complementary data for the other projects and a more complete understanding of emotional reactions among young children. The project directed by Drs. Meyer and Smothergill have no direct relationship to each other or to those of Dr. Schwarz.

PROGRAM: Social Emotional Program

1969-1970



S-BB

Title: Emotional Arousal and Social Context

Principal Staff: Schwarz, J. C., Orenstein, R.

Purpose, objective, or goals: To investigate experimentally the influence of social variables on emotional arousal in children. More specifically, this program of related studies is designed to test hypotheses derived from attachment theory. The first hypothesis tested was that children would show greater magnitudes of emotional response (GSR) to startle stimuli when alone than when in the presence of an attached peer (close friend). Although the initial analysis of this data looked favorable to the hypothesis, a more complete analysis taking into account the child's sex revealed interactions of social context with sex, thus requiring further replication. A small number of socially isolated children are also being tested.

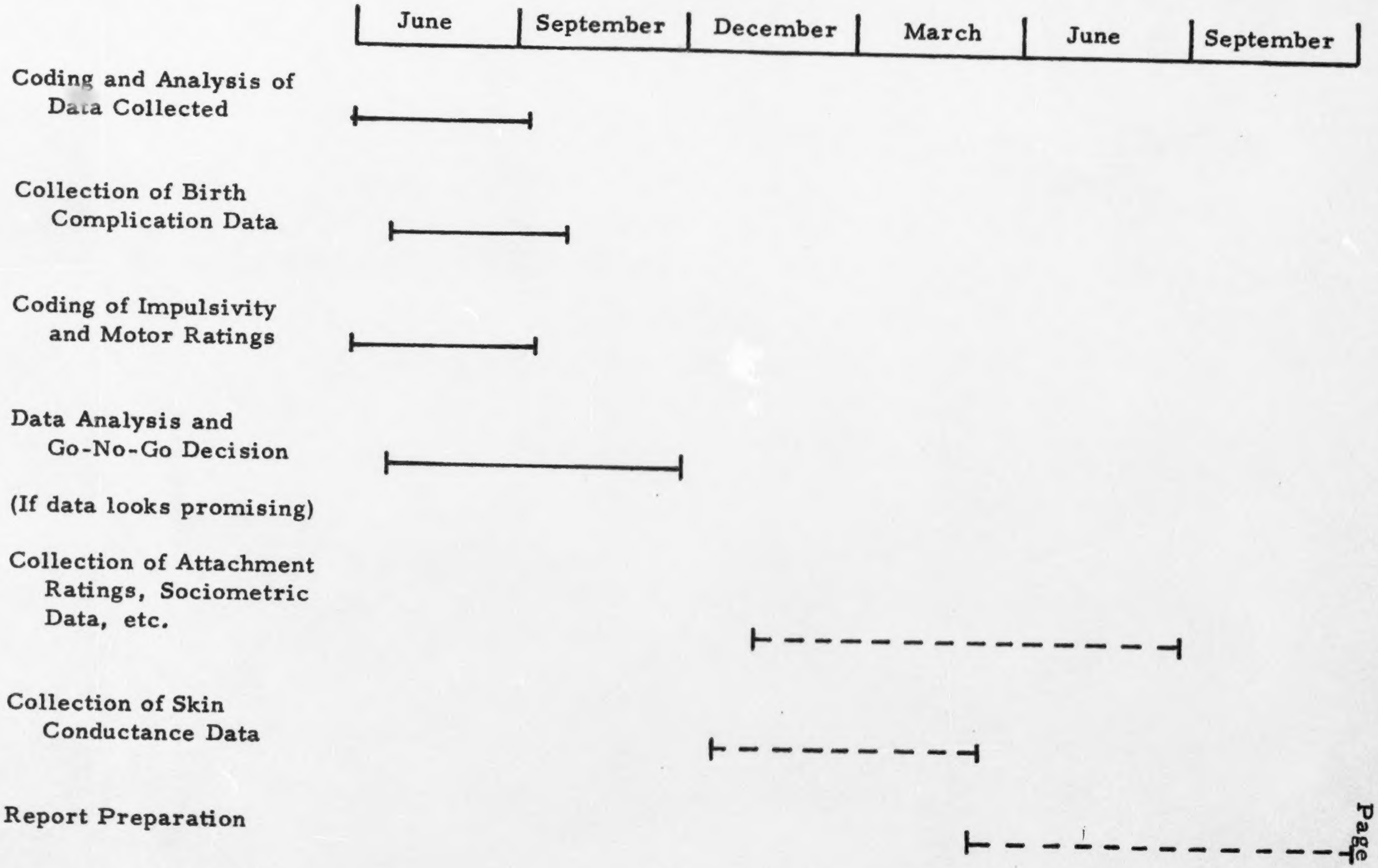
Importance, need, or justification: This research will help to specify some of the emotional consequences of social isolated and of the failure to develop social attachments to peers. Ultimately, information about variables which influence emotional arousal has relevance for the learning process, since it has been repeatedly demonstrated that there is a curvilinear relationship between emotional arousal and efficiency of learning. If it is demonstrated that the socially attached child is less disrupted by novel stimulation and also experiences a greater reduction of stress in the presence of his peers than does the social isolate, a clear case can be made for the inclusion of activities in the preschool curriculum which foster the development of social relationships in all children. Such findings may also point to biological differences in social isolates.

Method, strategy, or design: The subjects are drawn from the Center Nursery. Peer-isolate status assessed by a pictorial sociometric procedure and the strength of peer-attachments is rated by nursery school teachers. The sample is subdivided into high and low peer-attachment groups. Within each group, children will be randomly assigned to a (1) preferred-peer condition, (2) a nonpreferred-peer condition, or (3) a stranger-peer condition. All children will listen through ear phones to a tape recording

Method, strategy, or design (continued)	of randomly spaced sound effects while a continuous record of skin conductance is made. Social context will be varied by the presence of a preferred peer, a nonpreferred peer, or a strange peer. The dependent variable (skin conducted) will be analyzed in a 2x 3 x 7 analysis of variance design with repeated measures on the last factor (Attachment Status x Social Context x Trials). The rate of habituation of skin conductance responses to the sound effects will be related to motor-impulsivity and, if the data is available, to presence or absence of birth complications.
Characteristics of sample:	Investigators from other R & D Centers in early childhood education. Researchers in child development.
Expected end products of results:	Preparation of a research report for publication in the developmental psychology literature and circulation to investigators at other R & D Centers who are working in the area of social-emotional development.
Evaluation procedures:	The data collected Sept. 1968-June, 1969 will be given a preliminary analysis in the Summer 1969. If the results show favorable trends, data collection will be continued through the 1969-70 academic year, if not the project will be terminated with a final report in March 1970.
Relationship to other projects:	This study relates to other research projects on emotional development and social attachment being conducted by the author at this center and to the work on emotional responses in younger subjects of Henry N. Ricciuti at the Cornell Center and of Danial Freedman at the Chicago Center. The inquiry into birth complications and motor-impulsivity relates to the work of Dr. William Meyer at this Center, and to Dr. Sarnoff Mednick's work on the antecedents of psychiatric disorder in children.
Flow chart:	See attached.

Project: Emotional Arousal and Social Context

1969-1970



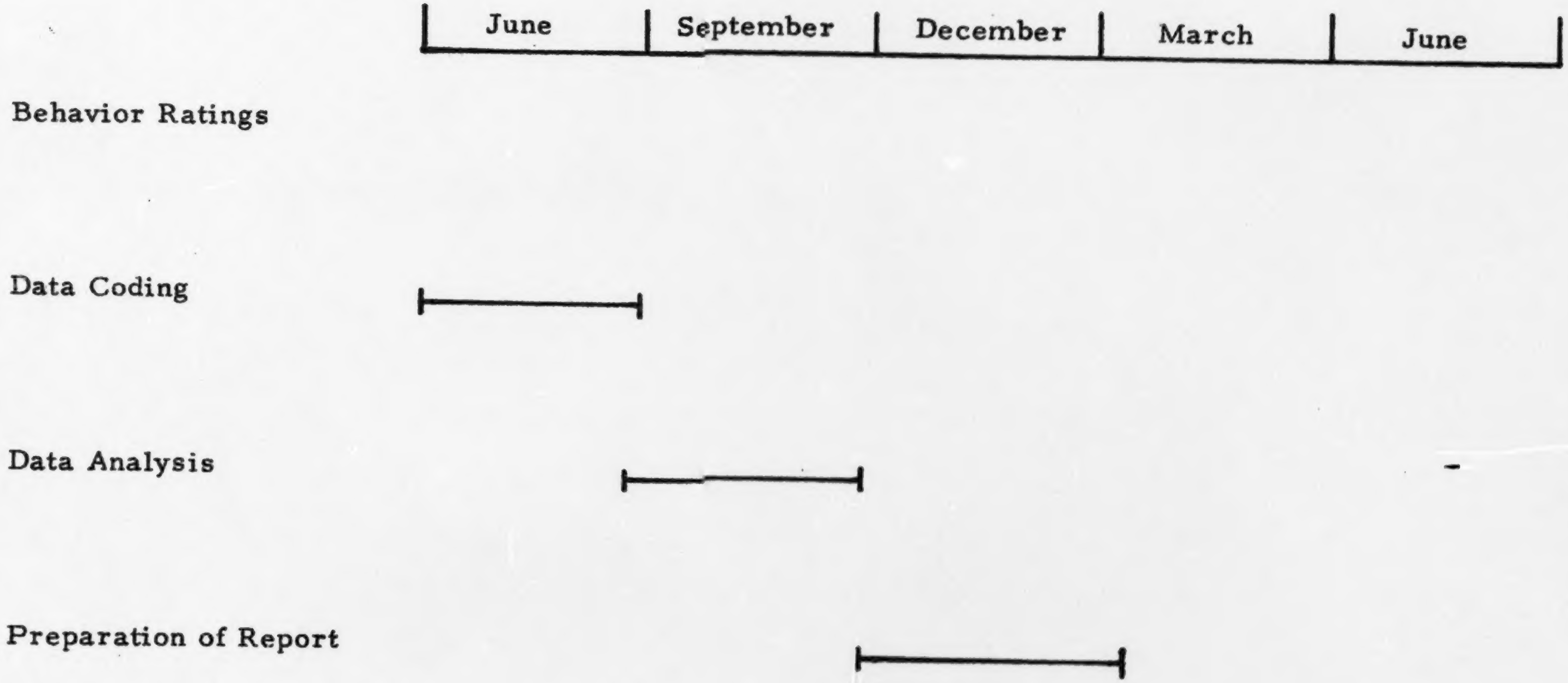
S-BD

Title:	Correlates of Peer Attachment Status
Principal Staff:	Schwarz, J. C.
Purpose, objective, or goals:	To investigate the social behavioral characteristics of children in the nursery school situation who fail to develop social attachments to peers after several months of attendance.
Importance, need, or justification:	The work of Harlow on social development in primates indicates that the development of affectional bonds to peers may be crucial to the development of a normal repertoire of social behaviors. An investigation of the behavioral correlates of peer attachment in humans will provide evidence of the generality of Harlow's posulated peer affectional system and of its dynamic consequences in children. These findings will bear upon the importance in pre-school curricula of programs which foster the development of social attachments among children.
Method, strategy, or design:	Ratings of the strength of peer attachments have been made by the head teacher and assistant teachers for all of the children in each class of the Center Nursery School. Ratings of strength of peer attachments are being correlated with the following variables: Ease of separation from the mother on the first day of school, initial and subsequent ratings of comfort in school, motor impulse control, perceptual-motor coordination, social competency ratings by the parents, sociometric status in nursery class, and history of peer associations prior to nursery school.
Characteristics of sample:	Child development specialists. Curriculum planners in early childhood education.
Expected end products of results:	Preparation of a research report for publication in the child development literature. Circulation of the report to other investigators with an interest in early social-emotional development and to curriculum planners at other R & D Centers.

Evaluation procedures:	Whereever possible the reliability of the measures employed in the correlational analysis will be assessed.
Relationship to other projects:	Several of the behavioral measures involved in this project have been employed in other projects at the Center, for example, in the longitudinal evaluation program, in the study of emotional arousal and social context which also investigate peer attachment status, and in the introduction to nursery school projects.
Flow chart:	See attached.

Project: Correlates of Peer Attachment Status

1970



S-BE

Title: Learning Social Roles

Principal Staff: W. J. Meyer

Purpose, objective, or goals: To examine the use children make of the widely used "dress-up corner."

Importance, need or justification: Almost every nursery school classroom contains a "dress-up corner" for the purpose of fostering social-role and/or sex-role development. Despite the wide use of this activity, it has not been ascertained how children perceive the activity. Indeed, there is little or no systematic evidence describing children's behavior while in the situation.

Method, strategy, or design: This project is relying entirely on observational procedures. Initially, video-tape recordings are being made from which a behavioral check-list will be developed. If there is any indication that, in fact, the children are making "appropriate" use of the activity, we will then observe behavior outside of the situation.

Characteristics of sample: The children in this project are from the Laboratory Nursery School. These are middle-middle class children.

Expected end products of results: A description of the typical behaviors of children in the "dress-up corner." In all probability this material will be published in an appropriate professional journal.

Evaluation procedures: In effect, the project is an evaluation of the activity. No separate evaluation procedures seem appropriate.

Flow chart: This project should be completed during Fiscal 1970.

S-BF

Title: Experimental Modification of the Reinforcement Value of Teachers' Social Responses

Principal Staff: Schwarz, J. C.;, Orenstein, R.

Purpose, objective, or goals: This project is an experimental test of the proposition that increases in the value of teachers' social responses can be achieved by fairly simple procedures performed by assistant teachers in the preschool setting, and that these increases will result in positive changes in the child's classroom adjustment over the course of a year. Therefore, children who are unresponsive to the teacher will be treated with desensitization and positive reward conditioning by the teacher. The effects of the treatment on the child's adjustment will be measured and compared with control subjects.

Importance, need, or justification: In any preschool class there are a few children whose behavior patterns and emotional reactions prevent them from making the most of their learning opportunities. If unaltered, these maladaptive behaviors are likely to result in a cumulative learning deficit which eventually will produce severe failure and frustration and an increasing aversion to the educational setting. Intervention to alter behavior problems at the preschool level can be justified on the basis of current evidence that these problems tend to persist throughout childhood. Although the selective application of social reinforcement appears to be effective method of modifying maladaptive classroom behavior, all children do not respond positively to the reinforcements of attention and approval typically dispensed by the teacher. Increasing the value of the teacher's social responses for such children will promote their "entry into natural communities of reinforcement" (Baer & Wolf, 1967) which were previously ineffective in influencing his behavior.

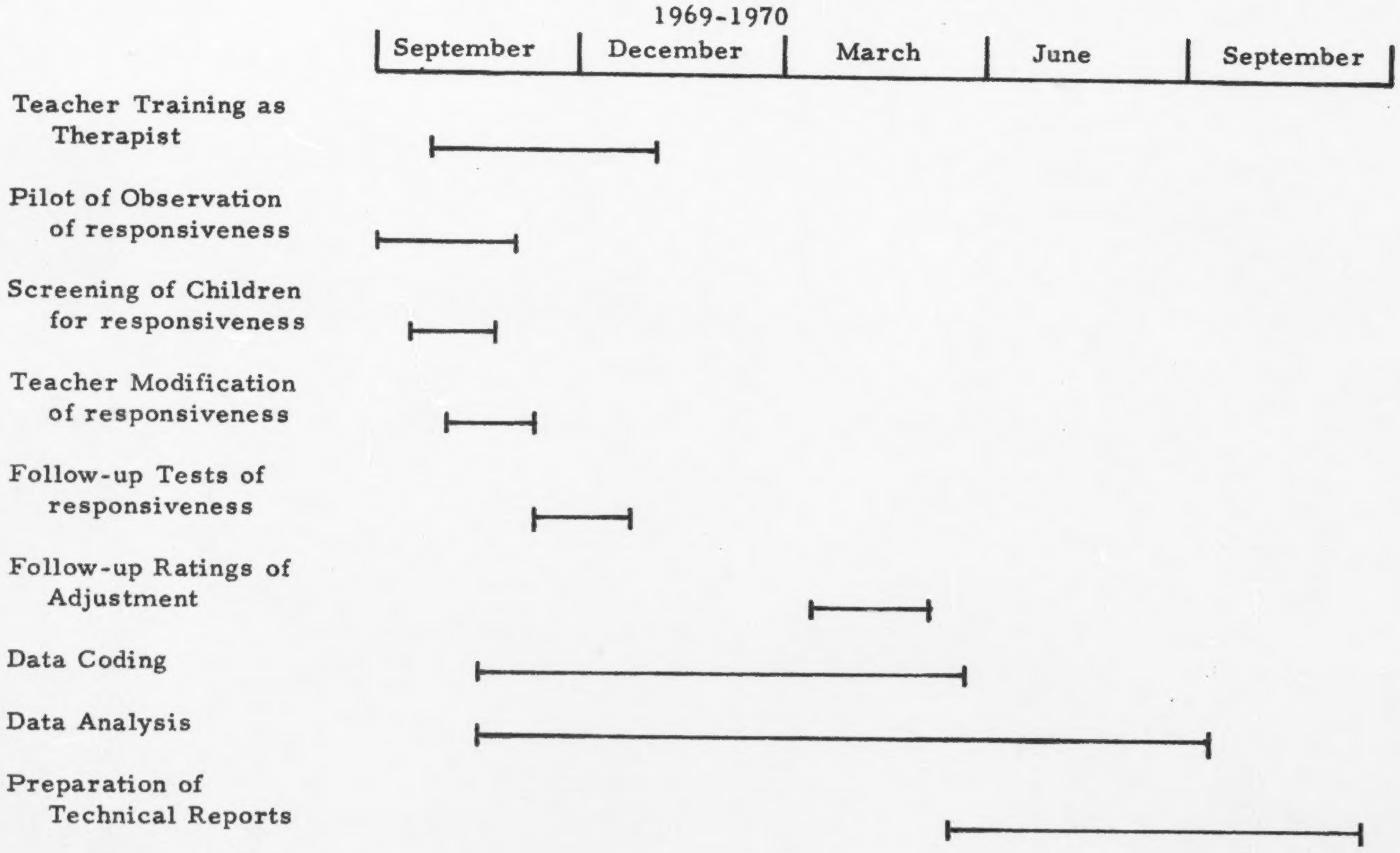
Method, strategy, or design: On the basis of teacher ratings children will be selected who are avoidant of and unresponsive to teachers. After this preliminary screening, observations will be made of the responsiveness of selected candidates in standard situations. Each candidate will be scored for teacher

Method, strategy, or design (continued)	proximity toleration, attention during group story, response to rest time request, and voluntary interaction with the teacher. Experimental children will be matched for behavior type, i. e., whether avoidant or unresponsive, and sex. The members of each pair will be randomly assigned to a treated control and an untreated experimental group. Teachers will not be informed of the status of children in the control group. The avoidant experimental children will be treated first in the classroom by progressively closer approaches by the teacher while they are pleasureably engaged in play. Following this desensitization procedure, both avoidant and unresponsive children will leave the classroom individually with the assistant teacher for daily 10 to 15 minute periods of pleasureable activity (positive conditioning). After the completion of three weeks of positive conditioning, the situational observations of responsiveness to the teacher will be repeated. Two months later and at the end of the school year the children will be rated by the head teachers for classroom adjustment. From each of the five classes of 18 children it is anticipated that from 4 to 6 children will participate in this study resulting in an experimental group of about 12 children with a matched control group of the same number.
Characteristics of sample:	Nursery school teachers; nursery school program planners; school and clinical psychologists; and child development specialists.
Expected end products of results:	Preparation of a report for publication in the child development literature and a non-technical report for a preschool education publication.
Evaluation Procedures:	Statistical comparisons will be made of the control and experimental groups to test the significance of changes in attraction and responsiveness to the teacher. Comparisons will also be made on social confidence, cooperativeness, task-persistence, the three indices of adjustment.

Relationship to other projects: This project is part of the program of studies on the social-emotional adjustment of nursery school children of the Syracuse R & D Center. Because of the extensive time committment entailed for the principle investigator, small grant application has been filed with the New York regional office of Education to provide a half-time salary for the academic year 1969-70. The budget of the Syracuse R & D Center was not sufficient to cover all of the direct costs of the project, and also meet other committments. If this grant is not approved, it will not be possible to conduct the project in the coming year. A 22-page description of the study detailing procedures and related research and theory has been submitted to Dr. John Sokol, the director of the New York Regional Office of Education.

Flow chart: See attached.

Project: Experimental Modification of the Reinforcement Value of Teachers' Social Responses



S-BG

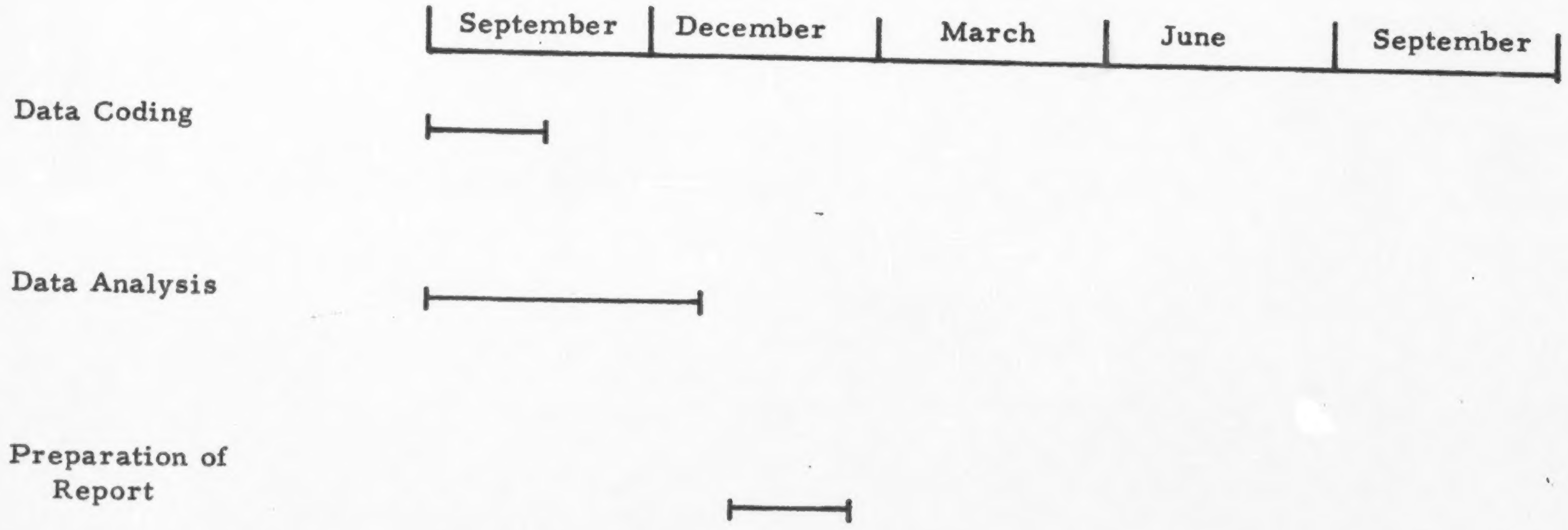
Title:	Starting Nursery School, II: Prediction of Children's Initial Emotional Reactions from Background Information.
Principal Staff:	Schwarz, J. C. ; Wynn, R.
Purpose, objective, or goals:	The purpose of this study is to seek factors in the child's background experience which may be predictive of his initial emotional reaction to beginning nursery school and of his early nursery adjustment.
Importance, need, or justification:	Among the children who start nursery school each year there is a significant percentage who show an initially adverse emotional reaction, which is distressing to the mother, the teachers, and other pupils. If these children could be identified in advance, it would be possible to arrange special methods for introducing these children to the classroom. Since most children in our population adjust readily, it would be uneconomical to have all of them go through such a therapeutic introduction to nursery school.
Method, strategy, or design:	In connection with an earlier experimental study of different methods of starting nursery school, data were collected on the emotional reactions of 100 four-year-old children to the first day of nursery school. From this sample groups of children will be selected who show extreme positive or extreme negative emotional reactions. Background experience factors, such as number of playmates, size of family, sibling position, etc. will be tested for their contribution to a discrimination between the adversely and positively reacting groups of children.
Characteristics of sample:	Curriculum planners in preschool programs; nursery school teachers; and child development specialists.
Expected end products of results:	Preparation of a report for publication in the child development literature.
Evaluation procedures:	Non-parametric statistical methods such as chi square will be used for nominal data; *t*-tests or Hoetelling's T^2 will be used for interval variables.

Relationship to other projects: This study is related to other experimental work by Schwarz and Wynn on factors influencing emotional reaction to starting nursery school. These other studies test the efficacy of current practices for reducing adverse reactions to starting nursery school. Methods discovered to be useful might then be used selectively on high risk identified in advance.

Flow chart: See attached.

Project: ***Starting Nursery School, II:*** **Prediction of Children's Initial Emotional Reactions from Background Information**

1969-1970



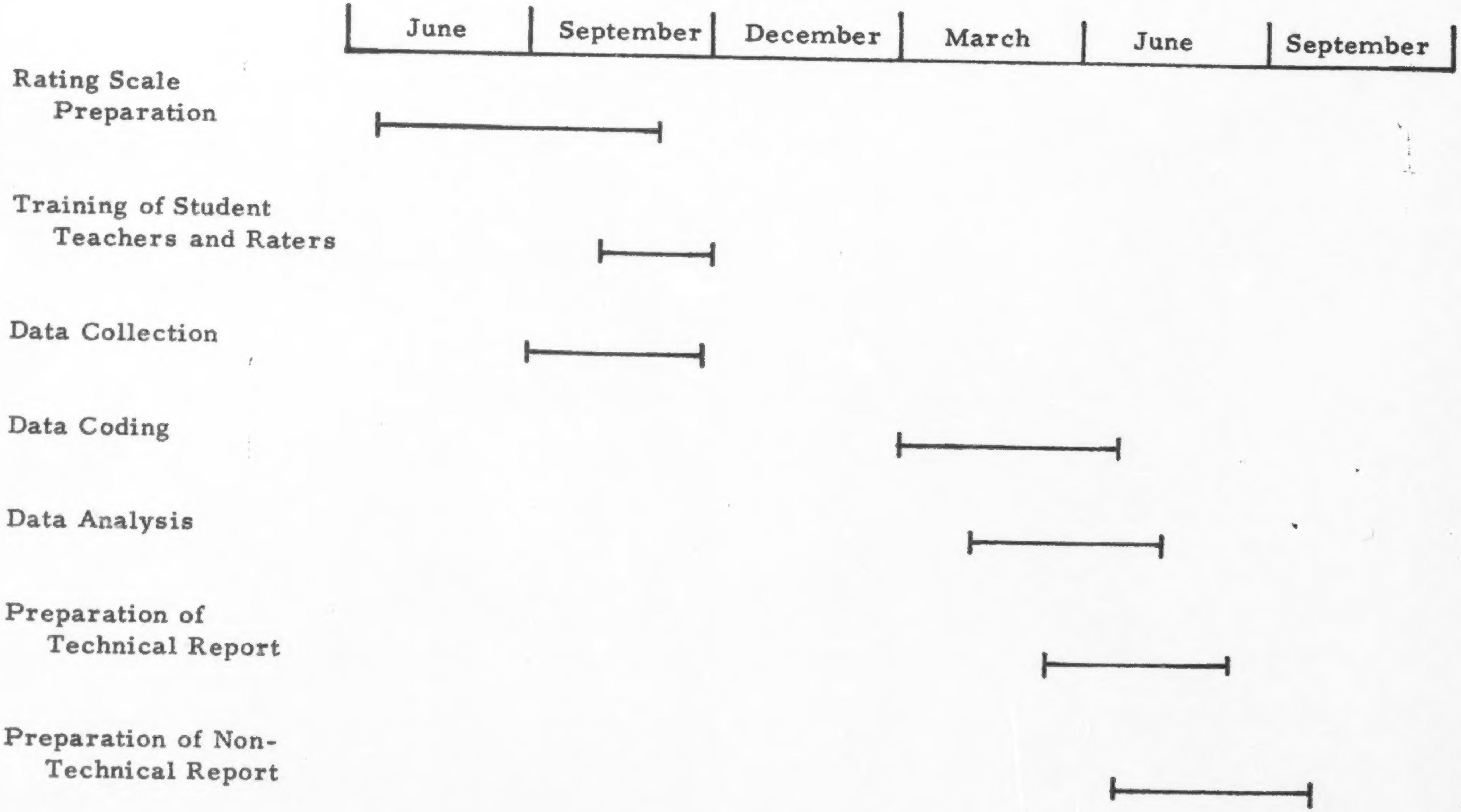
S-BH

Title:	Starting Nursery School, III: The Influence of Group Size on Children's Initial Emotional Reactions and Short Term Adjustment.
Principal Staff:	Schwarz, J. C.; Wynn, R.; Orenstein, R.
Purpose, objective, or goals:	To test the effects on a child's early emotional and behavioral adjustment of the size of the nursery school class to which he is first introduced. Will a child eventually adjust to a large class if he first starts in a small class, or is initial and short term adjustment just as good, if first introduced to a large class?
Importance, need, or justification:	Starting nursery school with groups of reduced size is a widely used practice for easing the transition from home to school. There appears to be no empirical evidence that this procedure serves the intended purpose. If it proves effective it can be used selectively for children most likely to have unfavorable reactions.
Method, strategy, or design:	In the Fall of 1969, the Liverpool Laboratory Nursery School will have an enrollment of 90 children divided into five classes of 18 each, balanced by sex. Two of these classes will be subdivided for the first week of school into groups of 6 children. The three large classes will each be staffed by a head teacher, and an assistant teacher and a student teacher. Since the classes to be subdivided have the same staff of three, each of the subgroups of 6 will have one teacher, either the head teacher, the assistant teacher, or a student teacher. In this manner the teacher-pupil ratio will be maintained at one teacher for each six pupils in all groups, small and large. In addition the duration of class meetings will be maintained at 1-1/2 hours for all groups during the first week. At the beginning of the second week the subdivided classes will be reunited and all classes will meet for the regular duration of 2-1/2 hours. With this design six different teachers will be employed with the six small groups and nine different teachers with the three large groups, thus permitting some generalization of results across teacher personality.

Characteristics of sample:	Nursery school program planners; nursery school teachers; and child development specialists.
Expected end products of results:	Preparation of a report for publication in the child development literature, and a nontechnical report for a preschool education publication.
Evaluation procedures:	Ratings will be made of the child's reaction to the mother's departure, the adaptiveness of play behavior, and of the child's comfort in the situation. Mother's will also rate their child's attitude toward nursery school. These ratings will be made for the first day of school and again during the second week, one day after the small groups have been recombined into the regular large classes. Additional measures of adjustment to group activities will be made during the second week. Statistical comparisons of children who began nursery school in small vs. large groups will be made on all of the measures mentioned above.
Relationship to other center projects and center focus:	This is the third of a series of studies of children's emotional reactions to beginning nursery school, and the second study experimentally testing the efficacy of traditional practices for reducing adverse emotional reactions to beginning nursery school.
Flow chart:	See attached.

Project: Starting Nursery School, III: The Influence of Group Size on Children's Initial Emotional Reactions and Short Term Adjustment

1969-1970



S-BI

Title: Starting Nursery School, IV: The Influence of Teacher Home Visits on Children's Initial Emotional Reactions and Teacher Effectiveness.

Principal Staff: Wynn, R.; Schwarz, J. C.

Purpose, objective, or goals: The teachers at the Liverpool Laboratory Nursery School have expressed a strong desire to visit the homes of all of their pupils before the start of school to meet the child and talk with the parents about the child. They feel strongly that this would facilitate the child's initial adjustment to nursery school and that the knowledge gained about the child's background would make them more effective in guiding the child's development over the year.

Importance, need, or justification: We feel that, because of the extensive time committment required on the part of the teachers, such a program should not be instituted without rigorous evaluation of its effects. Then a knowledgable decision can be made with regard to the desirability of making it a regular part of the nursery school program.

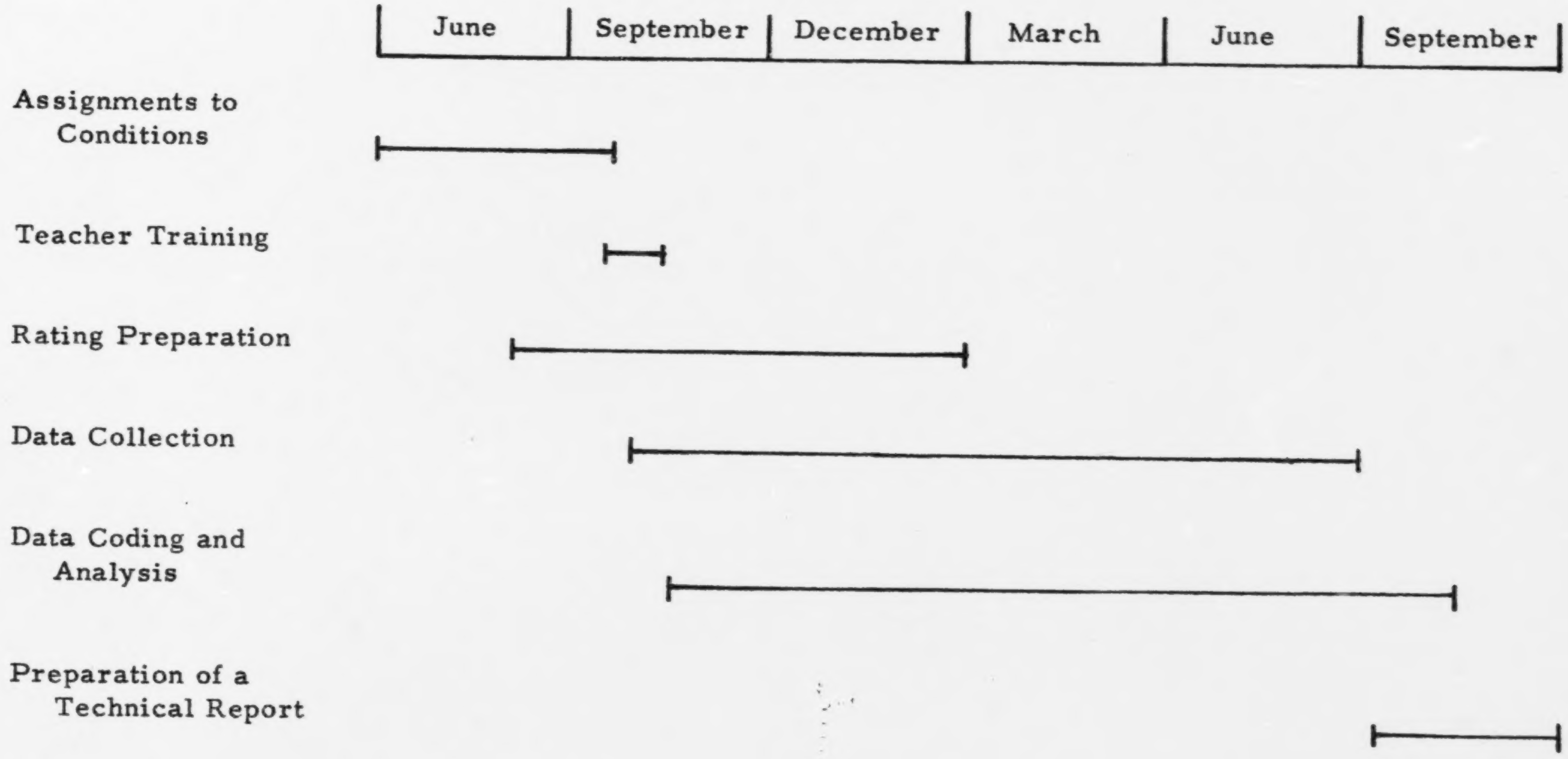
Method, strategy, or design: As tentatively conceived, home visits would be made by each classroom teacher to the homes of one-half of the pupils assigned to their classes for the Fall of 1970. Selection of pupils to be visited would be random and equal with respect to sex. Through group discussion the teachers would arrive at a mutually acceptable format for the content of these visits. Then all teachers would follow roughly the same format . As in earlier studies of starting nursery school, measures would be taken on the first day of nursery school of the children's emotional reactions. Follow-up measures of emotional and cognitive development can be made at periodic intervals. A mid-year home visit will be considered for all of the children in the experimental group if this seems feasible. Measures of the child's attitude toward school and his teacher may also be useful, as well as measures of the teacher's attitude toward the children.

Characteristics of sample: Nursery school program planners; nursery school teachers; and educators in general.

Expected end products of results:	Preparation of a report in an educational research journal.
Evaluation procedures:	Each dependent variable could be analyzed in a two-way analysis of variance design with five replications, one for each class. The two factors would be visited vs. nonvisited and male vs. female pupil. This design would permit an assessment of the variation of effect across teachers.
Relationship to other center projects and center focus:	This project would be the fourth in the proposed series of studies of factors influencing the child's initial adjustment to nursery school, one of which is completed (see Schwarz and Wynn, final report June, 1969).
Flow chart:	See attached.

Project: Starting Nursery School, IV: The Influence of Teacher Home Visits on Children's Initial Emotional Reactions and Teacher Effectiveness

1970-1971



S-BJ

Title: Methods of Assessing Social-Emotional Development

Principal Staff: J. C. Schwarz,

Purpose, objective, or goals: One of the major handicaps in studying personality development and adjustment in young children is the dearth of validated assessment instruments. The purpose of this project is to examine and gather evidence relevant to the validity of measures relating to coping and mastery. A brief situational test for assessing individual differences in the disposition to cope with mildly aversive stimuli will be explored.

Importance, need, or justification: When a teacher labels a child emotionally immature, she may be responding to any number of behavioral parameters: short attention span, failure to interact socially with others, tendency to have emotional outbursts when thwarted, failure to persist in the face of difficulty. Underlying some, but not all, of these behaviors may be a common dimension; namely, a low disposition to cope with, approach, and master mildly aversive situations. It is assumed that this is a behavioral disposition which has some generality across situations and which can be learned under the appropriate program of training and reinforcement. Valid tests of this disposition would be a valuable addition to our limited repertoire of assessment devices for young children.

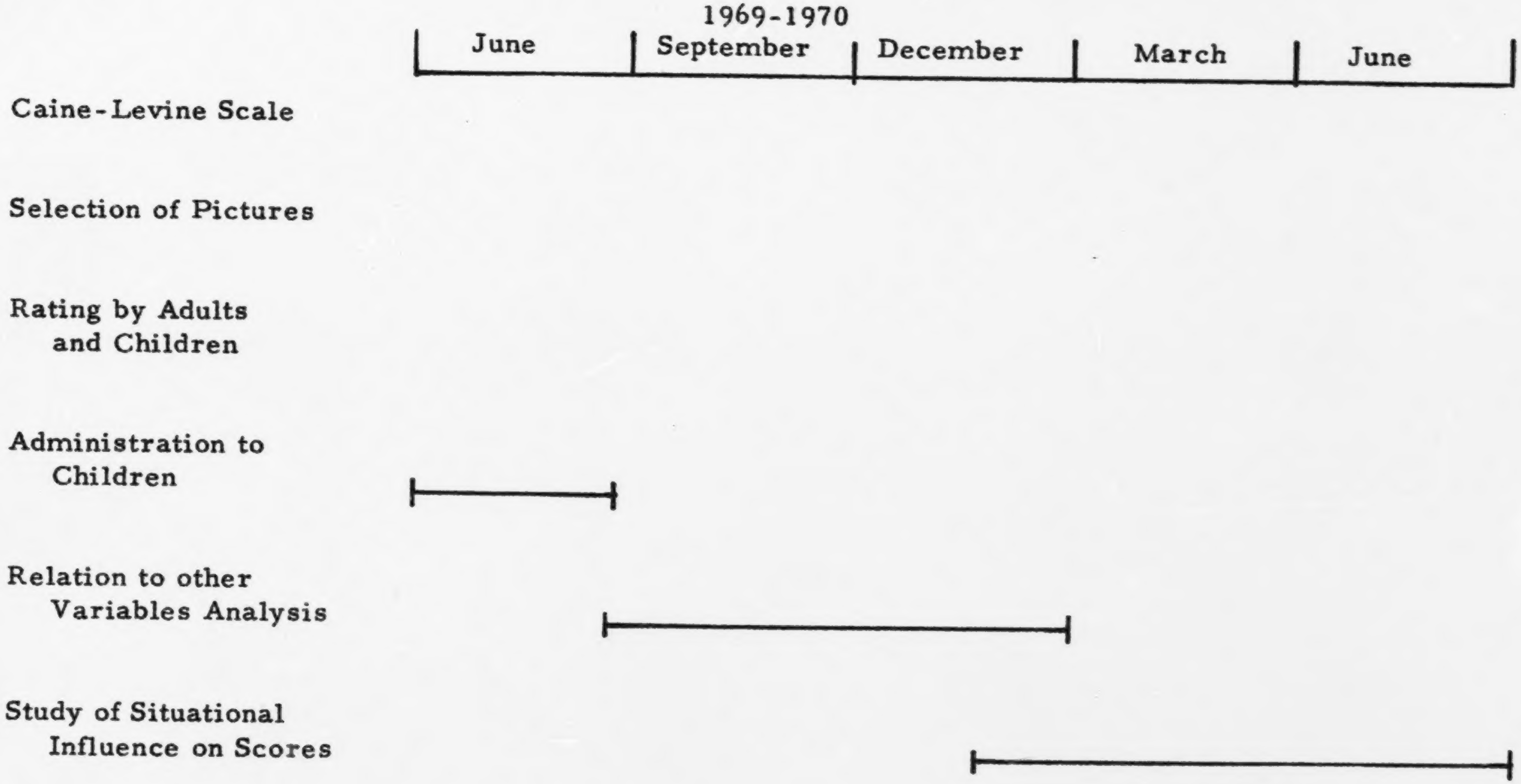
Method, strategy, or design: Development of a situational test of one aspect of coping behavior will involve the following steps:

1. Preliminary selection of a set of photographs, some of which are affectively neutral, some positive, and some mildly aversive or frightening to young children.
2. Rating of the potential aversiveness by adults who are familiar with the behavior of young children.
3. As a further check, rating the pictures for "scaryness" by 4 and 5 year olds.
4. Coping scores will be obtained by having children rate the pictures for "liking" on a 3-point scale. The coping score will consist of the total "liking" rating of pictures rated as "scary."

(The above steps in the project were completed as of June, 1969).

Method, strategy, or design (continued)	5. Scores will be correlated with the Caine-Levine Scales of social competency, and teacher ratings of classroom behavior. 6. The independence of this construct from other personality traits will be examined. 7. The sensitivity of the situational test of coping to the invluence of the social context of administration will be examined.
Characteristics of sample:	Investigators engaged in program evaluation. Researchers in social-emotional development in children.
Expected end products of results:	If the validational efforts prove successful, the end product will be a situational test of coping disposition with normative data for preschool populations. Publication of a research report.
Relationship to other center projects and center focus:	The development of coping disposition measures will provide assessment of a variable of theoretical importance with regard to its relationship to social-emotional parameters under investigation in other projects at the center; for example, the studies of learning social roles and response to beginning nursery school.
Flow chart:	See attached.

Project: Methods of Assessing Social-Emotional Development



Title:	The Cognitive Deficits Program
Principal Staff:	W. J. Meyer, R. Wynn, N. Smothergill, J. Dusek, C. Ragonese and E. Wilkie.
Purpose, objective, or goals:	To identify underlying intellectual skills required in numerous pre-school activities and in specially planned educational experiences.
Importance, need, or justification:	A distinction is made in this program between knowledge acquisition and intellectual skills. The former refers to the accumulation of facts and specific responses tied to specific stimuli, while the latter refers to the processes that underlie knowledge acquisition and usage. Considerable emphasis has been given to knowledge acquisition at the expense of identifying process. If intervention procedures are to have transfer value, it is crucial that these intellectual skills be identified and that procedures to enhance these intellectual skills be developed and field tested.
Method, strategy, or design:	A variety of methods are being employed by the individual investigators as they seem appropriate to the particular problem. These strategies and methods are described in the individual project resumes.
Characteristics of sample:	The evaluation procedures for the Language Project are being developed with a sample of "inner city" children. The remaining projects will focus on the children in the center laboratory school.
Expected end products of results:	Identification of intellectual processes possessed by normal four-year-old children. And identification of the intellectual skills emphasized by various pre-school educational experiences and their relationship to each other.
Evaluation procedures:	As underlying processes are systematically identified from the research program, it will be possible to translate this into specific lesson plans and procedures. It will then be possible to determine with greater precision why children have difficulty with certain tasks and what intervention is required. Evaluation then will focus on the effectiveness of our process of identification procedures and effectiveness of intervention procedures derived from this model.

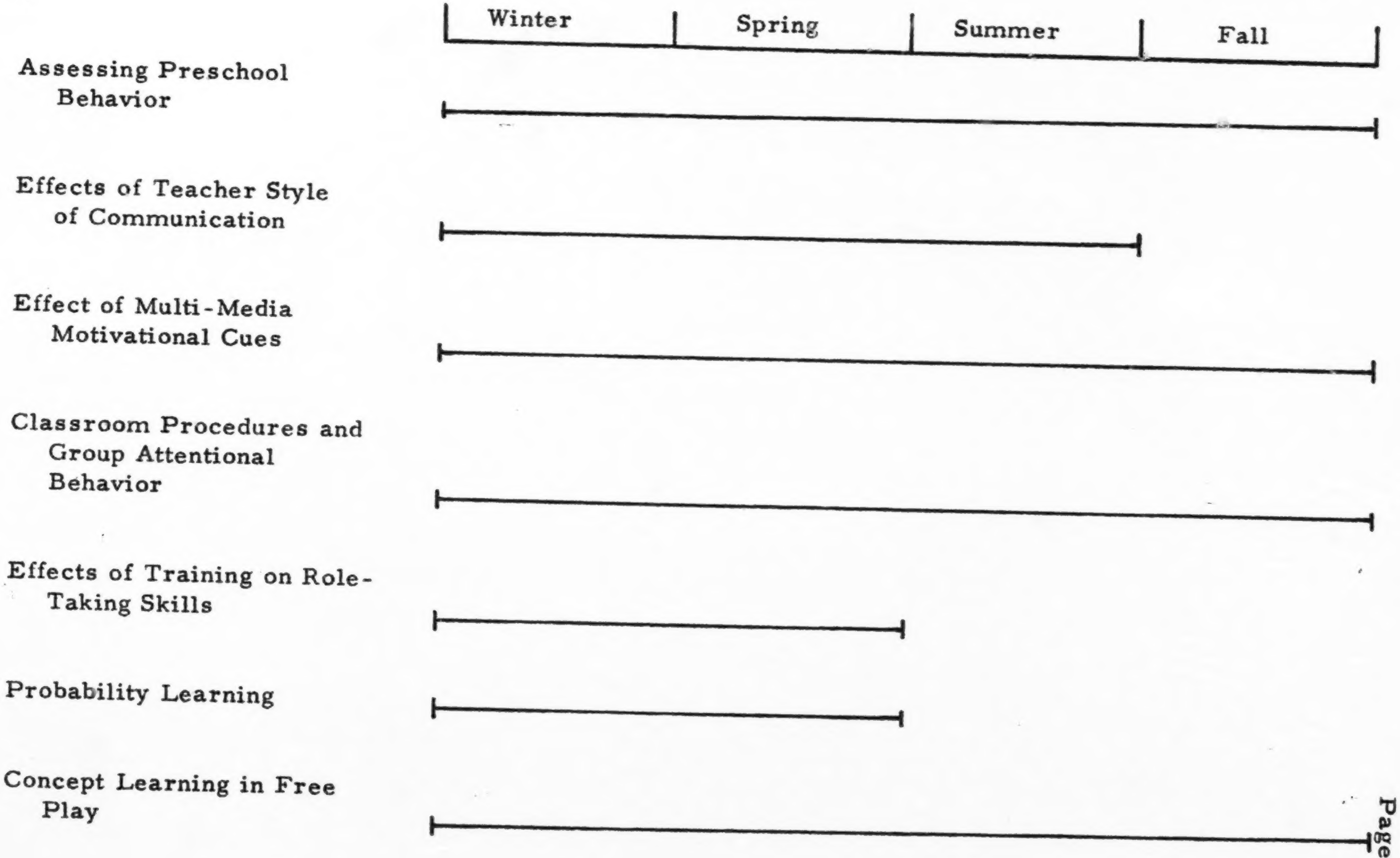
Relationship to other center projects and center focus: This program can be conceptualized as major development thrust of the center's focus. Thus, it is hoped that extremely well defined programs and procedures will emerge which reflect increased knowledge from both the cognitive analysis of behavior and social-emotional programs.

Flow chart: See attached.

Linkages within program: Nothing for the present.

PROGRAM: The Cognitive Deficits Program

1969-1970



S-CA

Title:	Assessing Preschool Behavior
Principal Staff:	W. J. Meyer, B. Van Auken
Purpose, objective, or goals:	To develop an instrument which samples behaviors hypothesized to be related to reading readiness.
Importance, need, or justification:	Currently available assessment techniques produce general omnibus scores which reveal little about the strengths and weaknesses within individuals. In order to intervene with children in a more meaningful manner, it is necessary to identify specific weaknesses and then prescribe specific remedial measures.
Method, strategy, or design:	Examination of the research literature to determine the possible behavioral capabilities related to reading. This procedure will be followed by the development of items and then field testing. Validation studies will be conducted using a longitudinal strategy.
Characteristics of sample:	Initial item development will involve the Laboratory Nursery School. As we gain knowledge about the items, it will be field tested using kindergarten-age children.
Expected end products of results:	A field tested instrument that will indicate strength and weaknesses of children relative to reading readiness.
Evaluation procedures:	The usual psychometric procedures for determining reliability and validity will be run.
Relationship to other center projects and center focus:	It is anticipated that the content of the items will include quantitative concepts, language usage (prepositional clauses), and orienting (attentional)behavior. Thus, knowledge gained from other projects should feed directly into the development of items.
Flow chart:	This project will continue through Fiscal 1970.

S-CG

Title: The Effects of Teacher Style of Communication in the Preschool.

Principal Staff: N. Smothergill, teachers at the R & D Center Preschool, Liverpool.

Purpose, objective, or goals: Observations of teachers had indicated that there may be marked differences between teachers along an elaborative-nonelaborative dimension in the verbal communication with the children in preschool. To date there is no data indicating the proportion of kinds of statements generally used by teachers and its relation to the kinds of activities present. The objectives of this project are: 1. To assess the range of proportions of different kinds of statements made by teachers and the relation of this range to the ideas of an elaborate-nonelaborate style of communication; 2. To assess the correlation of type of child verbalization with teacher berbalization; 3. To assess the effects of type of activity being presented on the proportion of kinds of statements made by the teacher; 4. To assess the effects of manipulation of teaching style on the child's ability to grasp the problem presented and use the information being transmitted.

Importance, need, or justification: Following the Hess and Shipman paradigm of the effects of maternal communication style on cognitive development of young children, manipulations of teachers style of communication were effected in the classroom. (See paper by Smothergill, Olson, and Moore, "The Effects of Manipulation of Teacher Communication Style in the Preschool," paper presented at biennial meeting of The Society for Research in Child Development, 1969.) The indications from this study were that the method or style of presentation of curriculum material may be just as important, if not more than the content of the curriculum The range of teacher interaction with the child and the effects of elaborating and eliciting feedback from the child must be investigated before any further statements can be made about the merits of one style of communication as opposed to another.

Method, strategy, or design:

The method of analysis will depend on the phase of research being conducted but generally differences between proportions of kinds of statements made under various conditions will be compared. T-tests and Analysis of Varience of the observational data will be used.

Characteristics of sample:

The sample of teachers will be drawn from the teaching staff at the R & D Center Preschool, Liverpool. The children within the classes will also be observed. Possibly the student teachers in training, doing their participation at the Laboratory School, will also be observed. The data will most likely have ramifications for preschool teachers and the use of paraprofessionals in preschool programs.

Expected end products of results:

This series of exploratory studies will give some indication of the range of teacher style of communication and the effects of different styles. The data should also suggest whether children taught under one style are better able to handle verbal information and to use verbalization in solving problems.

Evaluation procedures:

The procedure to be followed in this project involves several phases of both observation and exploratory manipulations. 1. Using the observation scheme developed for use in the previous study, observers will record and code samples of verbal communication of a range of teachers. The proportion of kinds of statements used will be determined. ; 2. On the basis of this initial observation data, observations will be made of these same teachers in different teaching activities and situations. Differences among teachers dependent on the type of activity presented will be observed. ; 3. Child verbalizations will also be recorded and coded using the observation scheme developed for the previous study. The frequency of proportion of kinds of verbalizations by child will be correlated with teacher communication style within the classroom. ; 4. Teachers using different proportions of kinds of statements will be asked to present the same activities and will be given generally the same lesson plan to follow. The goal of the activity may be to a certain degree determine the proportion of kinds of statements used by the teachers, regardless of

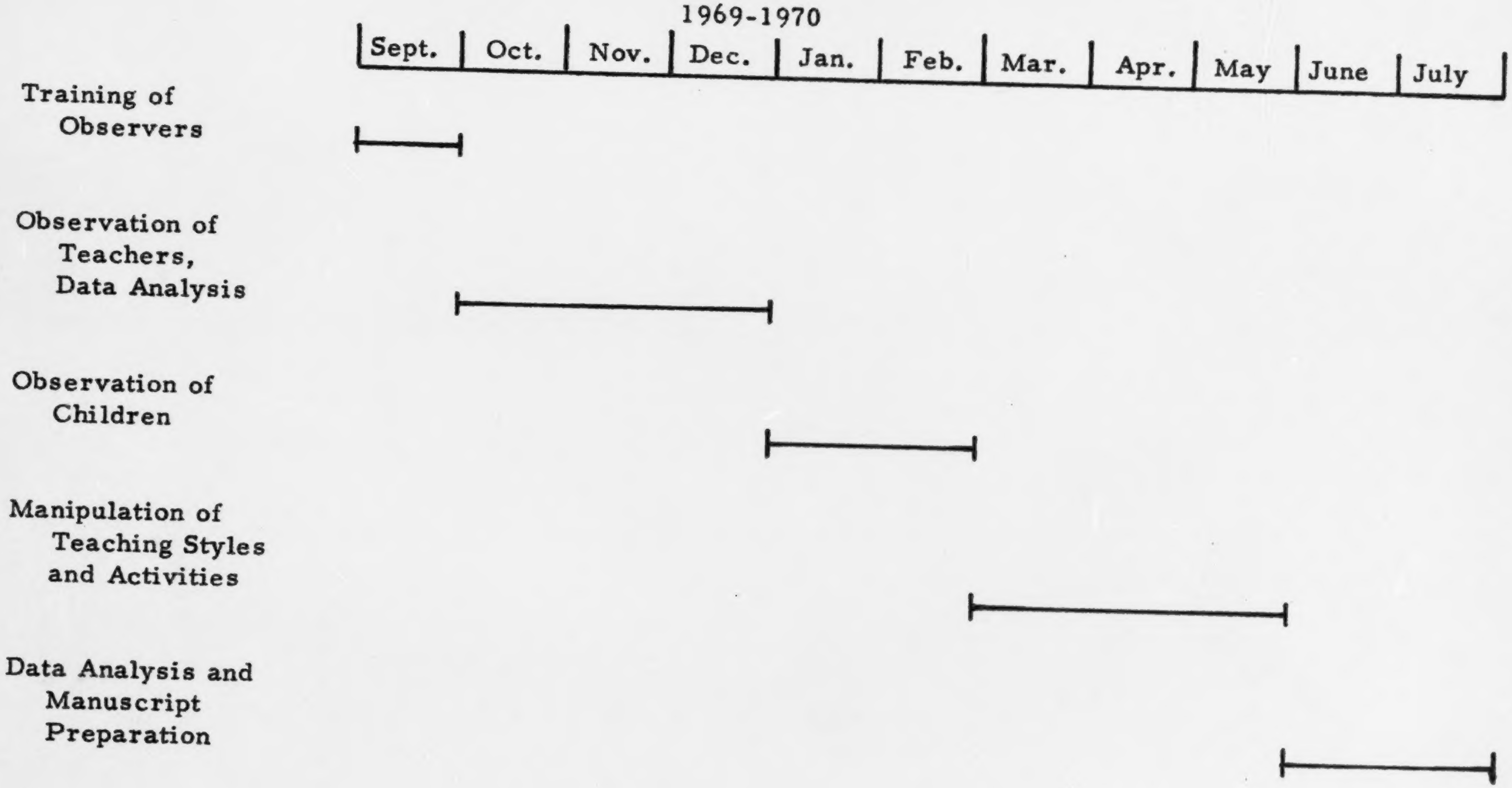
Evaluation procedures (continued)

her general style of communicating with the children.; 5. Finally, several teachers will be asked to teach under one style to one group of children, and under another group of children to a second group. The effects of the teaching style on the child's comprehension of the subject matter will then be tested. For this phase instruments or tasks to test the child's comprehension will have to be developed.

Flow chart:

See attached.

Project: The Effects of Teacher Style of Communication in the Preschool



S-CH

Title:	The Effect of Multi-media Motivational Cues on the Development on Circle/Round Concepts (as it relates to the creative attributes sensitivity, originality, and the ability to synthesize).
Principal staff:	Michael F. Andrews, James Cole
Purpose, objective, or goals:	To evaluate the effectiveness of multi-media motivational aids in expanding the child's sensory perceptions and aesthetic awareness and as a result nurturing greater sensitivity, ability to be original, and ability to synthesize.
Importance, need, or justification:	The neglect of aesthetic perception is quite evident. There is today a dire need for a study which critically observes the behavior of young children involved in truly aesthetic-type perceptions. The lack of such primordial experiences, especially at this critical preprimary level, results in an aesthetic or sensitivity deprivation syndrome. A creative curriculum is much needed.
Method, strategy, or design:	Designing of pre- and post-testing instruments to determine the children's sensitivity, ability to synthesize, and their degree of originality relative to circle/round concept. (Much like the pre- and post-test instruments to determine the children's degree of fluency, ability to abstract and ability to redefine). Setting up ten similar multi-media learning units for the twenty children in the test group. The ten units will involve a series of sensory experiences designed to nurture the above attributes of creative individuals. Post-testing to determine the effect of the multi-media motivational learning units.
Characteristics of sample:	Four-year-olds from the Liverpool Laboratory Nursery School (twenty boys and twenty girls) middle income group.
Ultimate Users:	The results of the study will be of value to the principal staff in structuring a sequential curriculum for the creative education of preprimary children.

Ultimate users (continued)	The testing devices, multi-media teaching aids, and subsequent curriculum may be made available to parents and teachers of preprimary age children.
Expected end products of results:	A series of testing devices or instruments to measure one's degree of creative attributes and a significant step toward structuring a curriculum for creative education for preprimary children.
Evaluation procedures:	Design instrument to determine children's ability to synthesize (to combine circular forms into a new whole or to combine foreign elements into a circle configuration), originality (uncommon perception or use of circle/round), and sensitivity (heightened awareness of circle/round configuration).
Flow chart:	December 1, 1969 to November 30, 1970 (12 months).

S-CI

Title: Classroom Procedures and Group Attentional Behavior

Principal Staff: R. Wynn, N. Smothergill, B. Muchs

Purpose, objective, or goals: This study is designed to systematically examine current classroom procedures that affect group attending behavior of preschoolers. The variables to be investigated are size of group and characteristics of instructional materials.

Importance, need, or justification: For most children, beginning nursery school is the introduction to a group experience. During the initial weeks of school, when presumably, the stimulation of a novel environment and the presence of many children is at its highest, the teacher must establish attending behavior in the group if future learning is to occur. This is important not only for the disadvantaged children who have not acquired the attending behaviors necessary for learning, but for the culturally advantaged children who have acquired these behaviors in the one-to-one situations provided in their homes by their mothers. The present project attempts to identify classroom procedures which will facilitate attending in the group.

Method, strategy, or design: The project will be conducted in the Center Laboratory Nursery School. The children will be observed during formal lessons. The lessons will be presented to both large groups, consisting of a class in toto (N=18) and to small groups (N=6). The lessons have been selected on the basis of their adaptability for presentation with both concrete teaching materials (three dimensional) and abstract teaching materials (two-dimensional). To achieve a completely balanced design each lesson will be presented in the four conditions (large-abstract, large-concrete, small-abstract, small-concrete) across classrooms and each teacher will present lessons in the four conditions. The study will be replicated across classrooms to counteract the effect due to differences in interest of the content of individual lessons for the children and for the teacher presenting them. The study is designed to investigate not only the main effects of group size and characteristics of classroom materials but their interaction, as well. The effect of the content of the individual lessons can also be examined. The observational ratings of the childrens behavior will be made on gross postural attention.

Characteristics of sample:	The children enrolled in the Center Laboratory Nursery are subjects in this project.
Expected end products of results:	Empirically based classroom procedures that increase group attending for use by teachers and curriculum planners in preschool programs and those responsible for their academic training. A report for a preschool education publication.
Evaluation procedures:	Assessment instruments for a pre-and post-test design will be administered for each lesson to ascertain the relationship between postural attention and learning. This project, however, is an evaluation of the effect of current classroom procedures on attending.
Relationship to other center projects and center focus:	This project should provide clues for the Center's objective of developing a preschool curriculum.
Flow chart:	December, 1969 - November 1970.

S-CJ

Title: The Effects of Training on Role-Taking Skills and Non-Egocentric Communication

Principal Staff: N. Smothergill, teaching staff at Laboratory Nursery School, Liverpool.

Purpose, objective, or goals: The objectives of this project are to assess the effects of different types of training on the preschooler's ability to be aware of the point of view of another person and on non-egocentric communication. This project will be executed within the classroom with different training experiences built into the curriculum.

Importance, need, or justification: The work of Piaget and Flavell has indicated that the preschool child has difficulty realizing that others may have a different point of view. A study by Smothergill (unpublished master's thesis) indicated that training may have an effect on the spatial-egocentricity of the preschool child. A difficulty which many preschool teachers encounter is that the child seems to be unaware that others may not be able to understand his egocentric communications. The preschooler often has difficulty in realizing that a person in another role may have a different point of view, or different feelings about events. One of the objectives in the preschool is the socialization of the young child; implicit in socialization is an increased awareness of differing perspectives of people around the child and the subsequent monitoring of activity and communication. The project outlines here proposes to explore techniques of training children in role-taking and communication skills.

Characteristics of sample: The Ss used in this study will be enrolled in the Laboratory Nursery School, Liverpool and will be trained within the classroom. The training techniques may ultimately be used by preschool teachers to enhance socialization within the classroom.

Method, strategy, or design: The procedure will include three phases: pretest, training, and posttest. Ss will be placed in three different groups. I. Role-play Group; II. Verbal-games Group; III. No training Group. All Ss will be given a battery of tasks aimed at assessing both the verbal level

Method, strategy, or design (continued)

and degree of egocentricity of the child. This battery is to be developed and will be taken from the work of Flavell. Matched samples will be assigned to the three training groups. Training for Group I (Role-play) will consist of practice in role playing, dramatization of parts, charades, use of puppets, acting out parts predetermined, as well as many opportunities for free dramatic play. Group II (Verbal-games) will be given practice on verbal games where he is required to communicate with another person, giving hints or clues, giving directions for another person to follow, asking others questions, and perhaps inquiry training (Suchman). Group III will receive no formalized training in role-taking but allowed opportunities for free dramatic play and socialization with others. Following the training period all groups will receive the posttest which is identical to the pretest.

Expected end products of results:

It is expected that this project will contribute to ideas of socialization of young children as well as to research on the development of logical thinking of the preschooler. The training procedures should give information as to what are useful in classroom techniques for enhancing communication skills and role-taking abilities.

Evaluation procedures:

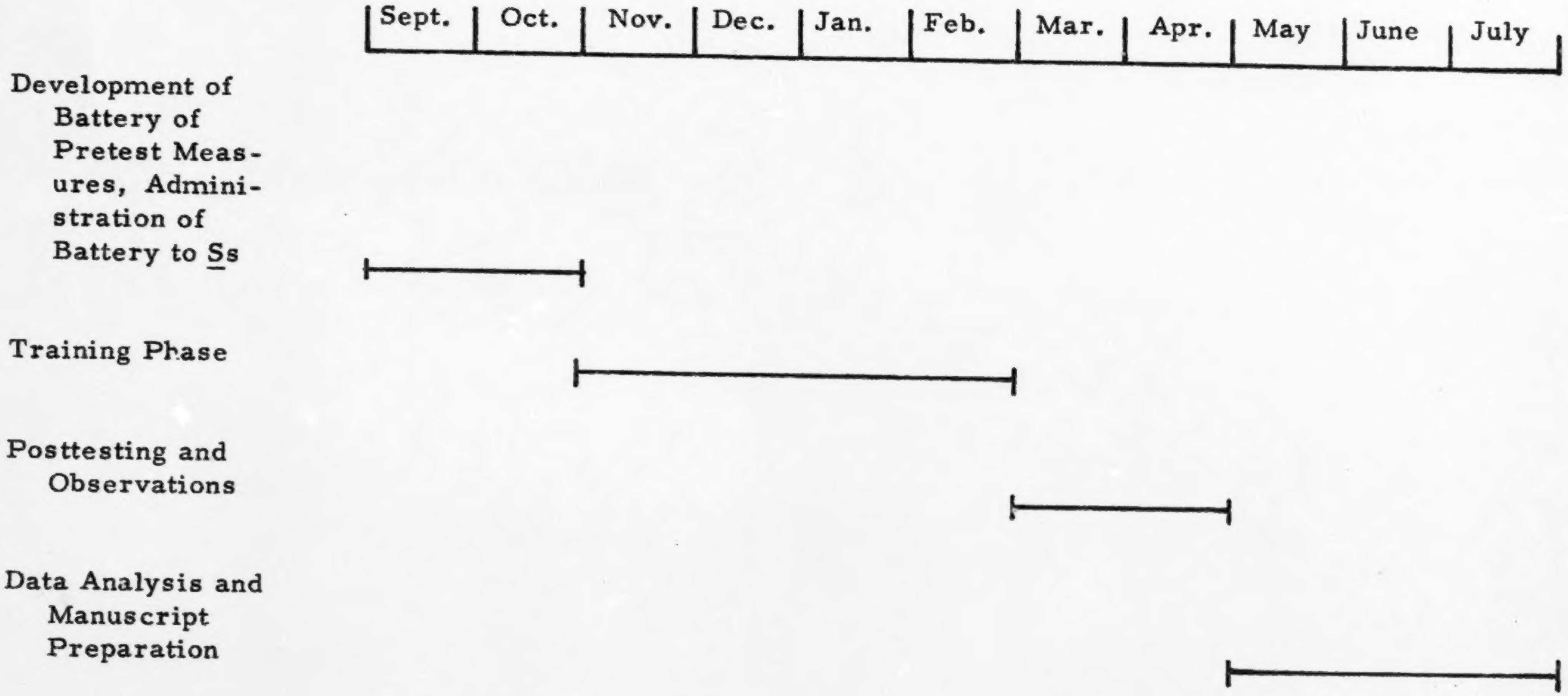
In analyzing the data differences in increments between groups will be analyzed. Ratings from teachers plus observations of children may also be used, but measures would need to be developed.

Flow chart:

See attached.

Project: The Effects of Training on Role-Taking Skills and Non-Egocentric Communication

1969-1970



S-CK

Title: Probability Learning in Preschoolers

Principal Staff: Mrs. N. Smothergill

Purpose, objective, or goals: The objective of the continuation of this project is to test whether training on probabilistic games enhances the child's understanding of probability. A study conducted by the author in 1969 indicated that training did affect the child's conception of chance. Difficulties encountered in that study were that the Ss were asked to transfer from a three-dimensional training task to two-dimensional testing stimuli. In the proposed project the dimensionality of the stimuli would be controlled.

Importance, need, or justification: The work of Piaget has indicated that preschoolers have difficulty conceiving of the notion of probability or of increasing their chances of winning. He indicates that because the child concentrates on one characteristic of a problem he cannot generalize over many experiences and generate rules or a logical strategy for solving a problem. It may be that the child has little conception of probability because he has had little opportunity to analyze his chances of winning and little experience with games of chance. If, however, the child is given much experience to explore his chances of winning at a game and taught a rule or principal of probability which applies to the particular game, he may be able to transfer this rule or notion of probability to other games of chance, hence approaching these problems in a more logical way.

Method, strategy, or design: The procedure to be followed is one of pretest, training and no-training phase, and post-test. The general procedure will be carried out in two conditions:
(A) Two-dimensional
(B) Three-dimensional

(A) Two dimensional
I. Pretest
All Ss will be given the pretest consisting of a series of questions about pairs of spinner games. The spinner games consist of circles divided into sections, each painted a different color. In the center of each circle is an arrow which spins freely to any one of the sections.

Method, strategy, or design (continued)	Ss are shown that they win when the arrow lands on a particular section and then asked to predict at which of pairs of spinner games he would win more often. He is asked to give his reasons for giving the answer he chooses. II. Training Group Experimental (E) will be given training on other spinner games, where more or fewer sections are involved. His chances of winning on one game will be very low and chances of winning on a second game high, as determined by the number of sections in each game. For winning, or predicting where the arrow will land on the high probability of winning game, Ss will be given a white chip; for winning or predicting correctly on the low probability or game with more choices, the Ss will be given a blue chip. After many trials with the games, Ss will be taught the rule that the more choices available, the smaller the chance of winning. Group Control (E) will be given no training. III. Post-test All Ss will be given the post-test, following the same procedure as for pretest. (B) Three-dimensional The procedure for the three-dimensional condition will be the same as the two-dimensional with one exception. Three-dimensional test and training stimuli will be used. Instead of spinner games, geometric shapes with sides painted different colors will be used.
Characteristics of sample:	The sample of children to be used will be drawn from the R & D Center preschool at Liverpool.
Expected end products of results:	It is expected that the data from the study will give a clearer indication as to a child's conception of the notions of probability and effects of training on the logical thought process of the child.
Evaluation procecures:	Pre- to Post-test increment scores in responses and reasons for responses will be compared. Special attention will be paid to the child's verbalization, using a quasi-"clinical method" as Piaget uses.
Flow chart:	See attached.

S-CL

Title:	Concept Learning in Free Play and Structured Settings
Principal Staff:	W. J. Meyer, F. Hughes, J. Dusek
Purpose, objective, or goals:	To determine how children make use of selected materials designed to foster cognitive development. A second objective is to examine the attributes of teacher-directed lessons; that is, given teacher-defined objectives and procedures, what aspects of the stimuli are salient to the children.
Importance, need, or justification:	The results of this project should provide answers to two fundamental questions in the area of early childhood education: 1. What use do four-year-old children make of preschool materials when their behavior is not directed. 2. What attributes of the stimulus situation are relevant to children in teacher-planned lessons. These questions are not only relevant to the "structured-unstructured program" controversy but are also related to the issue of how best to design a classroom and a lesson.
Method, strategy, or design:	This project relies entirely on observational procedures. Since there are few guidelines to direct observations, extensive video-tapes are being made of the children in the situations. From these tapes behavioral checklists will be derived permitting more flexible observational procedures.
Characteristics of sample:	The Laboratory Nursery School children are the primary subjects in this project.
Expected end products of results:	A detailed description of how children behave in structured and unstructured learning situations. In addition there will be video-tapes demonstrating particularly salient features of the situations.
Evaluation procedures:	In effect, this project is an evaluation of typical classroom procedures.
Relationship to other center projects and center focus:	This project could provide clues about stimulus saliency for the Quantitative Concepts, the Language Development, and the Hierarchial Learning Programs.
Flow chart:	This project should be completed during Fiscal 1970.